



SEQUENCE LISTING

<110> Clausen, Henrik  
Bennett, Eric P.

<120> METHODS TO IDENTIFY AGENTS MODULATING FUNCTIONS OF POLYPEPTIDE  
GALNAC-TRANSFERASES, PHARMACEUTICAL COMPOSITIONS COMPRISING SUCH AGENTS AND THE USE  
OF SUCH AGENTS FOR PREPARING MEDICAMENTS

<130> 04305/100H154-US2

<150> US 60/425,204

<151> 2002-11-08

<150> PCT/DK03/00763

<151> 2003-11-07

<160> 127

<170> PatentIn version 3.1

<210> 1

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic peptide

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His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro Ala Pro Gly Ser Thr  
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Ala Pro Pro Ala  
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<210> 2

<211> 24

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic peptide

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Thr Ala Pro Pro Ala His Gly Val Thr Ser Ala Pro Asp Thr Arg Pro  
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Ala Pro Gly Ser Thr Ala Pro Pro  
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<210> 3

<211> 167

<212> PRT

<213> Homo sapiens

<400> 3

Tyr Gly Asp Ile Ser Ser Arg Val Gly Leu Arg His Lys Leu Gln Cys  
1 5 10 15

Lys Pro Phe Ser Trp Tyr Leu Glu Asn Ile Tyr Pro Asp Ser Gln Ile  
20 25 30

Pro Arg His Tyr Phe Ser Leu Gly Glu Ile Arg Asn Val Glu Thr Asn  
35 40 45

Gln Cys Leu Asp Asn Met Ala Arg Lys Glu Asn Glu Lys Val Gly Ile  
50 55 60

Phe Asn Cys His Gly Met Gly Gly Asn Gln Val Phe Ser Tyr Thr Ala  
65 70 75 80

Asn Lys Glu Ile Arg Thr Asp Asp Leu Cys Leu Asp Val Ser Lys Leu  
85 90 95

Asn Gly Pro Val Thr Met Leu Lys Cys His His Leu Lys Gly Asn Gln  
100 105 110

Leu Trp Glu Tyr Asp Pro Val Lys Leu Thr Leu Gln His Val Asn Ser  
115 120 125

Asn Gln Cys Leu Asp Lys Ala Thr Glu Glu Asp Ser Gln Val Pro Ser  
130 135 140

Ile Arg Asp Cys Asn Gly Ser Arg Ser Gln Gln Trp Leu Leu Arg Asn  
145 150 155 160

Val Thr Leu Pro Glu Ile Phe  
165

<210> 4  
<211> 164  
<212> PRT  
<213> Homo sapiens

<400> 4

Tyr Gly Asn Ile Gln Ser Arg Leu Glu Leu Arg Lys Lys Leu Ser Cys  
1 5 10 15

Lys Pro Phe Lys Trp Tyr Leu Glu Asn Val Tyr Pro Glu Leu Arg Val  
20 25 30

Pro Asp His Gln Asp Ile Ala Phe Gly Ala Leu Gln Gln Gly Thr Asn  
35 40 45

Cys Leu Asp Thr Leu Gly His Phe Ala Asp Gly Val Val Gly Val Tyr  
2



50

55

60

Glu Cys His Asn Ala Gly Gly Asn Gln Glu Trp Ala Leu Thr Lys Glu  
65 70 75 80

Lys Ser Val Lys His Met Asp Leu Cys Leu Thr Val Val Asp Arg Ala  
85 90 95

Pro Gly Ser Leu Ile Lys Leu Gln Gly Cys Arg Glu Asn Asp Ser Arg  
100 105 110

Gln Lys Trp Glu Gln Ile Glu Gly Asn Ser Lys Leu Arg His Val Gly  
115 120 125

Ser Asn Leu Cys Leu Asp Ser Arg Thr Ala Lys Ser Gly Gly Leu Ser  
130 135 140

Val Glu Val Cys Gly Pro Ala Leu Ser Gln Gln Trp Lys Phe Thr Leu  
145 150 155 160

Asn Leu Gln Gln

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<212> PRT  
<213> Homo sapiens

<400> 5

Phe Gly Asp Leu Ser Lys Arg Phe Glu Ile Lys His Arg Leu Arg Cys  
1 5 10 15

Lys Asn Phe Thr Trp Tyr Leu Asn Asn Ile Tyr Pro Glu Val Tyr Val  
20 25 30

Pro Asp Leu Asn Pro Val Ile Ser Gly Tyr Ile Lys Ser Val Gly Gln  
35 40 45

Pro Leu Cys Leu Asp Val Gly Glu Asn Asn Gln Gly Gly Lys Pro Leu  
50 55 60

Ile Met Tyr Thr Cys His Gly Leu Gly Gly Asn Gln Tyr Phe Glu Tyr  
65 70 75 80

Ser Ala Gln His Glu Ile Arg His Asn Ile Gln Lys Glu Leu Cys Leu  
85 90 95

His Ala Ala Gln Gly Leu Val Gln Leu Lys Ala Cys Thr Tyr Lys Gly  
100 105 110

His Lys Thr Val Val Thr Gly Glu Gln Ile Trp Glu Ile Gln Lys Asp  
115 120 125

Gln Leu Leu Tyr Asn Pro Phe Leu Lys Met Cys Leu Ser Ala Asn Gly  
130 135 140

Glu His Pro Ser Leu Val Ser Cys Asn Pro Ser Asp Pro Leu Gln Lys  
145 150 155 160

Trp Ile Leu Ser Gln Asn Asp  
165

<210> 6  
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<213> Homo sapiens

<400> 6

Ala Tyr Gly Asp Ile Ser Glu Arg Lys Leu Leu Arg Glu Arg Leu Arg  
1 5 10 15

Cys Lys Ser Phe Asp Trp Tyr Leu Lys Asn Val Phe Pro Asn Leu His  
20 25 30

Val Pro Glu Asp Arg Pro Gly Trp His Gly Ala Ile Arg Ser Arg Gly  
35 40 45

Ile Ser Ser Glu Cys Leu Asp Tyr Asn Ser Pro Asp Asn Asn Pro Thr  
50 55 60

Gly Ala Asn Leu Ser Leu Phe Gly Cys His Gly Gln Gly Gly Asn Gln  
65 70 75 80

Phe Phe Glu Tyr Thr Ser Asn Lys Glu Ile Arg Phe Asn Ser Val Thr  
85 90 95

Glu Leu Cys Ala Glu Val Pro Glu Gln Lys Asn Tyr Val Gly Met Gln  
100 105 110

Asn Cys Pro Lys Asp Gly Phe Pro Val Pro Ala Asn Ile Ile Trp His  
115 120 125

Phe Lys Glu Asp Gly Thr Ile Phe His Pro His Ser Gly Leu Cys Leu  
130 135 140

Ser Ala Tyr Arg Thr Pro Glu Gly Arg Pro Asp Val Gln Met Arg Thr  
145 150 155 160

Cys Asp Ala Leu Asp Lys Asn Gln Ile Trp Ser Phe Glu Lys  
165 170

<210> 7  
<211> 168  
<212> PRT  
<213> Homo sapiens

<400> 7

Asp Val Gly Asn Leu Thr Gln Gln Arg Glu Leu Arg Lys Lys Leu Lys  
1 5 10 15

Cys Lys Ser Phe Lys Trp Tyr Leu Glu Asn Val Phe Pro Asp Leu Arg  
20 25 30

Ala Pro Ile Val Arg Ala Ser Gly Val Leu Ile Asn Val Ala Leu Gly  
35 40 45

Lys Cys Ile Ser Ile Glu Asn Thr Thr Val Ile Leu Glu Asp Cys Asp  
50 55 60

Gly Ser Lys Glu Leu Gln Gln Phe Asn Tyr Thr Trp Leu Arg Leu Ile  
65 70 75 80

Lys Cys Gly Glu Trp Cys Ile Ala Pro Ile Pro Asp Lys Gly Ala Val  
85 90 95

Arg Leu His Pro Cys Asp Asn Arg Asn Lys Gly Leu Lys Trp Leu His  
100 105 110

Lys Ser Thr Ser Val Phe His Pro Glu Leu Val Asn His Ile Val Phe  
115 120 125

Glu Asn Asn Gln Gln Leu Leu Cys Leu Glu Gly Asn Phe Ser Gln Lys  
130 135 140

Ile Leu Lys Val Ala Ala Cys Asp Pro Val Lys Pro Tyr Gln Lys Trp  
145 150 155 160

Lys Phe Glu Lys Tyr Tyr Glu Ala  
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<400> 8

Ser Phe Gly Asp Ile Ser Glu Arg Leu Gln Leu Arg Glu Gln Leu His  
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 Cys His Asn Phe Ser Trp Tyr Leu His Asn Val Tyr Pro Glu Met Phe  
                     20                                      25                                      30  
 Val Pro Asp Leu Thr Pro Thr Phe Tyr Gly Ala Ile Lys Asn Leu Gly  
                     35                                      40                                      45  
 Thr Asn Gln Cys Leu Asp Val Gly Glu Asn Asn Arg Gly Gly Lys Pro  
                     50                                      55                                      60  
 Leu Ile Met Tyr Ser Cys His Gly Leu Gly Gly Asn Gln Tyr Phe Glu  
                     65                                      70                                      75                                      80  
 Tyr Thr Thr Gln Arg Asp Leu Arg His Asn Ile Ala Lys Gln Leu Cys  
                     85                                      90                                      95  
 Leu His Val Ser Lys Gly Ala Leu Gly Leu Gly Ser Cys His Phe Thr  
                     100                                      105                                      110  
 Gly Lys Asn Ser Gln Val Pro Lys Asp Glu Glu Trp Glu Leu Ala Gln  
                     115                                      120                                      125  
 Asp Gln Leu Ile Arg Asn Ser Gly Ser Gly Thr Cys Leu Thr Ser Gln  
                     130                                      135                                      140  
 Asp Lys Lys Pro Ala Met Ala Pro Cys Asn Pro Ser Asp Pro His Gln  
                     145                                      150                                      155                                      160  
 Leu Trp Leu Phe Val  
                                     165

<210> 9  
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<400> 9

Tyr Gly Asp Ile Ser Glu Leu Lys Lys Phe Arg Glu Asp His Asn Cys  
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 Gln Ser Phe Lys Trp Phe Met Glu Glu Ile Ala Tyr Asp Ile Thr Ser  
                     20                                      25                                      30  
 His Tyr Pro Leu Pro Pro Lys Asn Val Asp Trp Gly Glu Ile Arg Gly  
                     35                                      40                                      45  
 Phe Glu Thr Ala Tyr Cys Ile Asp Ser Met Gly Lys Thr Asn Gly Gly  
                     50                                      55                                      60

Phe Val Glu Leu Gly Pro Cys His Arg Met Gly Gly Asn Gln Leu Phe  
65 70 75 80

Arg Ile Asn Glu Ala Asn Gln Leu Met Gln Tyr Asp Gln Cys Leu Thr  
85 90 95

Lys Gly Ala Asp Gly Ser Lys Val Met Ile Thr His Cys Asn Leu Asn  
100 105 110

Glu Phe Lys Glu Trp Gln Tyr Phe Lys Asn Leu His Arg Phe Thr His  
115 120 125

Ile Pro Ser Gly Lys Cys Leu Asp Arg Ser Glu Val Leu His Gln Val  
130 135 140

Phe Ile Ser Asn Cys Asp Ser Ser Lys Thr Thr Gln Lys Trp Glu Met  
145 150 155 160

Asn Asn Ile His Ser Val  
165

<210> 10  
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<212> PRT  
<213> Homo sapiens

<400> 10

Phe Gly Asp Val Ser Ser Arg Met Ala Leu Arg Glu Lys Leu Lys Cys  
1 5 10 15

Lys Thr Phe Asp Trp Tyr Leu Lys Asn Val Tyr Pro Leu Leu Lys Pro  
20 25 30

Leu His Thr Ile Val Gly Tyr Gly Arg Met Lys Asn Leu Leu Asp Glu  
35 40 45

Asn Val Cys Leu Asp Gln Gly Pro Val Pro Gly Asn Thr Pro Ile Met  
50 55 60

Tyr Tyr Cys His Glu Phe Ser Ser Gln Asn Val Tyr Tyr His Leu Thr  
65 70 75 80

Gly Glu Leu Tyr Val Gly Gln Leu Ile Ala Glu Ala Ser Ala Ser Asp  
85 90 95

Arg Cys Leu Thr Asp Pro Gly Lys Ala Glu Lys Pro Thr Leu Glu Pro  
100 105 110

Cys Ser Lys Ala Ala Lys Asn Arg Leu His Ile Tyr Trp Asp Phe Lys  
115 120 125

Pro Gly Gly Ala Val Ile Asn Arg Asp Thr Lys Arg Cys Leu Glu Met  
130 135 140

Lys Lys Asp Leu Leu Gly Ser His Val Leu Val Leu Gln Thr Cys Ser  
145 150 155 160

Thr Gln Val Trp Glu Ile Gln His Thr Val Arg Asp Trp Gly Gln Thr  
165 170 175

Asn Ser Gln

<210> 11  
<211> 177  
<212> PRT  
<213> Homo sapiens

<400> 11

Phe Gly Asp Val Ser Glu Arg Leu Ala Leu Arg Gln Arg Leu Lys Cys  
1 5 10 15

Arg Ser Phe Lys Trp Tyr Leu Glu Asn Val Tyr Pro Glu Met Arg Val  
20 25 30

Tyr Asn Asn Thr Leu Thr Tyr Gly Glu Val Arg Asn Ser Lys Ala Ser  
35 40 45

Ala Tyr Cys Leu Asp Gln Gly Ala Glu Asp Gly Asp Arg Ala Ile Leu  
50 55 60

Tyr Pro Cys His Gly Met Ser Ser Gln Leu Val Arg Tyr Ser Ala Asp  
65 70 75 80

Gly Leu Leu Gln Leu Gly Pro Leu Gly Ser Thr Ala Phe Leu Pro Asp  
85 90 95

Ser Lys Cys Leu Val Asp Asp Gly Thr Gly Arg Met Pro Thr Leu Lys  
100 105 110

Arg Cys Glu Asp Val Ala Arg Pro Thr Gln Arg Leu Trp Asp Phe Thr  
115 120 125

Gln Ser Gly Pro Ile Val Ser Arg Ala Thr Gly Arg Cys Leu Glu Val  
130 135 140



Glu Met Ser Lys Asp Ala Asn Phe Gly Leu Arg Leu Val Val Gln Arg  
145 150 155 160

Cys Ser Gly Gln Lys Trp Met Ile Arg Asn Trp Ile Lys His Ala Arg  
165 170 175

His

<210> 12  
<211> 187  
<212> PRT  
<213> Homo sapiens

<400> 12

Ala Gly Asp Val Ala Val Gln Lys Lys Leu Arg Ser Ser Leu Asn Cys  
1 5 10 15

Lys Ser Phe Lys Trp Phe Met Thr Lys Ile Ala Trp Asp Leu Pro Lys  
20 25 30

Phe Tyr Pro Pro Val Glu Pro Pro Ala Ala Ala Trp Gly Glu Ile Arg  
35 40 45

Asn Val Gly Thr Gly Leu Cys Ala Asp Thr Lys His Gly Ala Leu Gly  
50 55 60

Ser Pro Leu Arg Leu Glu Gly Cys Val Arg Gly Arg Gly Glu Ala Ala  
65 70 75 80

Trp Asn Asn Met Gln Val Phe Thr Phe Thr Trp Arg Glu Asp Ile Arg  
85 90 95

Pro Gly Asp Pro Gln His Thr Lys Lys Phe Cys Phe Asp Ala Ile Ser  
100 105 110

His Thr Ser Pro Val Thr Leu Tyr Asp Cys His Ser Met Lys Gly Asn  
115 120 125

Gln Leu Trp Lys Tyr Arg Lys Asp Lys Thr Leu Tyr His Pro Val Ser  
130 135 140

Gly Ser Cys Met Asp Cys Ser Glu Ser Asp His Arg Ile Phe Met Asn  
145 150 155 160

Thr Cys Asn Pro Ser Ser Leu Thr Gln Gln Trp Leu Phe Glu His Thr  
165 170 175

Asn Ser Thr Val Leu Glu Lys Phe Asn Arg Asn  
9

180

185

<210> 13  
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 <213> Homo sapiens

<400> 13

Asn Ile Ser Glu Arg Val Glu Leu Arg Lys Lys Leu Gly Cys Lys Ser  
 1 5 10 15

Phe Lys Trp Tyr Leu Asp Asn Val Tyr Pro Glu Met Gln Ile Ser Gly  
 20 25 30

Ser His Ala Lys Pro Gln Gln Pro Ile Phe Val Asn Arg Gly Pro Lys  
 35 40 45

Arg Pro Lys Val Leu Gln Arg Gly Arg Leu Tyr His Leu Gln Thr Asn  
 50 55 60

Lys Cys Leu Val Ala Gln Gly Arg Pro Ser Gln Lys Gly Gly Leu Val  
 65 70 75 80

Val Leu Lys Ala Cys Asp Tyr Ser Asp Pro Asn Gln Ile Trp Ile Tyr  
 85 90 95

Asn Glu Glu His Glu Leu Val Leu Asn Ser Leu Leu Cys Leu Asp Met  
 100 105 110

Ser Glu Thr Arg Ser Ser Asp Pro Pro Arg Leu Met Lys Cys His Gly  
 115 120 125

Ser Gly Gly Ser Gln Gln Trp Thr Phe Gly Lys Asn Asn Arg Leu Tyr  
 130 135 140

Gln Val Ser Val Gly Gln Cys Leu Arg Ala Val Asp Pro Leu Gly Gln  
 145 150 155 160

Lys Gly Ser Val Ala Met Ala Ile Cys Asp Gly Ser Ser Ser Gln Gln  
 165 170 175

Trp His Leu Glu Gly  
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<210> 14  
 <211> 173  
 <212> PRT  
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<400> 14

Asp Val Thr Glu Arg Lys Gln Leu Arg Asp Lys Leu Gln Cys Lys Asp  
 1 5 10 15  
 Phe Lys Trp Phe Leu Glu Thr Val Tyr Pro Glu Leu His Val Pro Glu  
 20 25 30  
 Asp Arg Pro Gly Phe Phe Gly Met Leu Gln Asn Lys Gly Leu Thr Asp  
 35 40 45  
 Tyr Cys Phe Asp Tyr Asn Pro Pro Asp Glu Asn Gln Ile Val Gly His  
 50 55 60  
 Gln Val Ile Leu Tyr Leu Cys His Gly Met Gly Gln Asn Gln Phe Phe  
 65 70 75 80  
 Glu Tyr Thr Ser Gln Lys Glu Ile Arg Tyr Asn Thr His Gln Pro Glu  
 85 90 95  
 Gly Cys Ile Ala Val Glu Ala Gly Met Asp Thr Leu Ile Met His Leu  
 100 105 110  
 Cys Glu Glu Thr Ala Pro Glu Asn Gln Lys Phe Ile Leu Gln Glu Asp  
 115 120 125  
 Gly Ser Leu Phe His Glu Gln Ser Lys Lys Cys Val Gln Ala Ala Arg  
 130 135 140  
 Lys Glu Ser Ser Asp Ser Phe Val Pro Leu Leu Arg Asp Cys Thr Asn  
 145 150 155 160  
 Ser Asp His Gln Lys Trp Phe Phe Lys Glu Arg Met Leu  
 165 170

<210> 15  
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 <212> PRT  
 <213> Homo sapiens

<400> 15

Glu Lys Pro Asp Cys Met Glu Arg Leu Gln Leu Gln Arg Arg Leu Gly  
 1 5 10 15  
 Cys Arg Thr Phe His Trp Phe Leu Ala Asn Val Tyr Pro Glu Leu Tyr  
 20 25 30  
 Pro Ser Glu Pro Arg Pro Ser Phe Ser Gly Lys Leu His Asn Thr Gly  
 35 40 45

Leu Gly Leu Cys Ala Asp Cys Gln Ala Glu Gly Asp Ile Leu Gly Cys  
50 55 60

Pro Met Val Leu Ala Pro Cys Ser Asp Ser Arg Gln Gln Gln Tyr Leu  
65 70 75 80

Gln His Thr Ser Arg Lys Glu Ile His Phe Gly Ser Pro Gln His Leu  
85 90 95

Cys Phe Ala Val Arg Gln Glu Gln Val Ile Leu Gln Asn Cys Thr Glu  
100 105 110

Glu Gly Leu Ala Ile His Gln Gln His Trp Asp Phe Gln Glu Asn Gly  
115 120 125

Met Ile Val His Ile Leu Ser Gly Lys Cys Met Glu Ala Val Val Gln  
130 135 140

Glu Asn Asn Lys Asp Leu Tyr Leu Arg Pro Cys Asp Gly Lys Ala Arg  
145 150 155 160

Gln Gln Trp Arg Phe Asp Gln Ile Asn Ala Val Asp Glu Arg  
165 170

<210> 16  
<211> 165  
<212> PRT  
<213> Homo sapiens

<400> 16

Tyr Gly Asp Val Ser Val Arg Lys Thr Leu Arg Glu Asn Leu Lys Cys  
1 5 10 15

Lys Pro Phe Ser Trp Tyr Leu Glu Asn Ile Tyr Pro Asp Ser Gln Ile  
20 25 30

Pro Arg Arg Tyr Tyr Ser Leu Gly Glu Ile Arg Asn Val Glu Thr Asn  
35 40 45

Gln Cys Leu Asp Asn Met Gly Arg Lys Glu Asn Glu Lys Val Gly Ile  
50 55 60

Phe Asn Cys His Gly Met Gly Gly Asn Gln Val Phe Ser Tyr Thr Ala  
65 70 75 80

Asp Lys Glu Ile Arg Thr Asp Asp Leu Cys Leu Asp Val Ser Arg Leu  
85 90 95

Asn Gly Pro Val Ile Met Leu Lys Cys His His Met Arg Gly Asn Gln  
12

100

105

110

Leu Trp Glu Tyr Asp Ala Glu Arg Leu Thr Leu Arg His Val Asn Ser  
 115 120 125

Asn Gln Cys Leu Asp Glu Pro Ser Glu Glu Asp Lys Met Val Pro Thr  
 130 135 140

Met Gln Asp Cys Ser Gly Ser Arg Ser Gln Gln Trp Leu Leu Arg Asn  
 145 150 155 160

Met Thr Leu Gly Thr  
 165

<210> 17  
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<400> 17

Phe Gly Asn Val Glu Ser Arg Leu Asp Leu Arg Lys Asn Leu Arg Cys  
 1 5 10 15

Gln Ser Phe Lys Trp Tyr Leu Glu Asn Ile Tyr Pro Glu Leu Ser Ile  
 20 25 30

Pro Lys Glu Ser Ser Ile Gln Lys Gly Asn Ile Arg Gln Arg Gln Lys  
 35 40 45

Cys Leu Glu Ser Gln Arg Gln Asn Asn Gln Glu Thr Pro Asn Leu Lys  
 50 55 60

Leu Ser Pro Cys Ala Lys Val Lys Gly Glu Asp Ala Lys Ser Gln Val  
 65 70 75 80

Trp Ala Phe Thr Tyr Thr Gln Lys Ile Leu Gln Glu Glu Leu Cys Leu  
 85 90 95

Ser Val Ile Thr Leu Phe Pro Gly Ala Pro Val Val Leu Val Leu Cys  
 100 105 110

Lys Asn Gly Asp Asp Arg Gln Gln Trp Thr Lys Thr Gly Ser His Ile  
 115 120 125

Glu His Ile Ala Ser His Leu Cys Leu Asp Thr Asp Met Phe Gly Asp  
 130 135 140

Gly Thr Glu Asn Gly Lys Glu Ile Gly Val Asn Pro Cys Glu Ser Ser  
 145 150 155 160  
 13

Leu Met Ser Gln His Trp Asp Met Val Ser Ser  
165 170

<210> 18  
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<212> PRT  
<213> Homo sapiens

<400> 18

Ser Val Ala Thr Arg Ile Glu Gln Arg Lys Lys Met Asn Cys Lys Ser  
1 5 10 15

Phe Arg Trp Tyr Leu Glu Asn Val Tyr Pro Glu Leu Thr Val Pro Val  
20 25 30

Lys Glu Ala Leu Pro Gly Ile Ile Lys Gln Gly Val Asn Cys Leu Glu  
35 40 45

Ser Gln Gly Gln Asn Thr Ala Gly Asp Phe Leu Leu Gly Met Gly Ile  
50 55 60

Cys Arg Gly Ser Ala Lys Asn Pro Gln Pro Ala Gln Ala Trp Leu Phe  
65 70 75 80

Ser Asp His Leu Ile Gln Gln Gln Gly Lys Cys Leu Ala Ala Thr Ser  
85 90 95

Thr Leu Met Ser Ser Pro Gly Ser Pro Val Ile Leu Gln Met Cys Asn  
100 105 110

Pro Arg Glu Gly Lys Gln Lys Trp Arg Arg Lys Gly Ser Phe Ile Gln  
115 120 125

His Ser Val Ser Gly Leu Cys Leu Glu Thr Lys Pro Ala Gln Leu Val  
130 135 140

Thr Ser Lys Cys Gln Ala Asp Ala Gln Ala Gln Gln Trp Gln Leu Leu  
145 150 155 160

Pro His Thr

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<212> PRT  
<213> Homo sapiens

<400> 19

Trp Tyr Leu Glu Asn Val Tyr Pro  
1 5

<210> 20  
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<212> DNA  
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<223> PCR primer

<400> 20  
gcgggatcca ggacttcctg ctggagatg 29

<210> 21  
<211> 28  
<212> DNA  
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<220>  
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<400> 21  
gcggatcctc agaatatttc tggaaggg 28

<210> 22  
<211> 35  
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<220>  
<223> PCR primer

<400> 22  
gcggaattct taaaaagaaa gaccttcac acagc 35

<210> 23  
<211> 28  
<212> DNA  
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<220>  
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<400> 23  
gcggaattcc tactgctgca gggtgagc 28

<210> 24  
<211> 28  
<212> DNA  
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<220>  
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gcgggatcca acgatggaaa ggaacatg 28

<210> 25  
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 agcggatcca ggaacactta atcattttgg c 31

<210> 26  
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 <223> PCR primer  
  
 <400> 26  
 gcgggatcct ttcatgcct ccgcaggagc c 31

<210> 27  
 <211> 30  
 <212> DNA  
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 <223> PCR primer  
  
 <400> 27  
 gcgggatccg acgaaagtgc tgttgtgctc 30

<210> 28  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 28  
 gcgggatcct gctttaactg gagggctaga gc 32

<210> 29  
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 <212> DNA  
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 <220>  
 <223> PCR primer  
  
 <400> 29  
 gcgggatcca tcagttacac ttcaggcttc 30

<210> 30  
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 <212> DNA  
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<220>  
 <223> PCR primer  
  
 <400> 30  
 gcgggatccc ctggacctca tgctggaggc catg 34  
  
 <210> 31  
 <211> 32  
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 <223> PCR primer  
  
 <400> 31  
 agcggatcct ggggatgatc tgggtcctag ac 32  
  
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 gcgaagcttc aggatgaggg aagacagaga tg 32  
  
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 <212> DNA  
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 <223> PCR primer  
  
 <400> 33  
 gcgaagcttc tctctaaaca ctatggatct tattc 35  
  
 <210> 34  
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 <220>  
 <223> PCR primer  
  
 <400> 34  
 gcgggatcct ctgaaagaaa gtatgaaatt agc 33  
  
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 <220>  
 <223> PCR primer

<400> 35  
gcgggaccc cactggctgt tggctgacc 30

<210> 36  
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<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 36  
gcgggacccc tgccgcctgc agggccgctc ccag 34

<210> 37  
<211> 32  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 37  
gcgggaccc cagtgccgctc ggtgtttgat cc 32

<210> 38  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 38  
gcgggacccc cgcgagcggc agcccgcagg c 31

<210> 39  
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<212> DNA  
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<220>  
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<400> 39  
gcgggaccc cagttcctat tgaatttttc 30

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<220>  
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<400> 40  
gcgaattcgt gaagtgactc agccacttaa g 31

<210> 41  
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 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 41  
 gcgaattcgt ctctgtcaga cacgtgtc

28

<210> 42  
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 <212> DNA  
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<220>  
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<400> 42  
 gcgggatccg gctcgggtgct gcgggacgag cg

32

<210> 43  
 <211> 35  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 43  
 gcgggatcct cataacatgc gctctttgaa gaacc

35

<210> 44  
 <211> 34  
 <212> DNA  
 <213> Artificial Sequence

<220>  
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<400> 44  
 gcgggatccg atgttgacv vtccccacca cacc

34

<210> 45  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer

<400> 45  
 gcgggatcct catcggtcat ccacagcatt g

31

<210> 46  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> PCR primer  
  
 <400> 46  
 gcgggatcct ctgctgcctg cattgagggc tg 32  
  
 <210> 47  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 47  
 gcgggatcct catgtgccca aggtcatgtt cc 32  
  
 <210> 48  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 48  
 gcgggatccc aagaggaagt tggaggtgcc g 31  
  
 <210> 49  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
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 gcgggatccc aggggtcctc aagagctcac c 31  
  
 <210> 50  
 <211> 33  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 50  
 gcgggatccc tactacttat ggcaggacaa ccg 33  
  
 <210> 51  
 <211> 30  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer

<400> 51  
gcgtcatgtg tgtggcaaca gctgccactg 30

<210> 52  
<211> 157  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic nucleotide

<400> 52  
gcggccgctc tagaactagt ggatccagca gccatcatca tcatcatcac agcagcggcc 60  
tggtgccgcg cggcagccat atggctagca tgactggtgg acagcaaata ggtcgcggaa 120  
ttccgatatc aagcttatcg ataccgctga cctcgag 157

<210> 53  
<211> 123  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> synthetic nucleotide

<400> 53  
gaattcgcg cgcagcagc catcatcatc atcatcacag cagcggcctg gtgccgcgcg 60  
gcagccatat ggctagcatg actggtggac agcaaata tccactagtt ctagagcggc 120  
cgc 123

<210> 54  
<211> 1746  
<212> DNA  
<213> Homo sapiens

<400> 54  
atgtgggggc gcacggcgcg gcggcgctgc ccgcggaac tgcggcgcg ccgggaggcg 60  
ctgttggtgc tcctggcgct actggcgctg gccgggctgg gctcggtgct gcgggcgcag 120  
cgtggggccg gggccggggc tgccgagccg ggacccccgc gcacccccgc ccccgggcgg 180  
cgcgagccgg tcatgccgcg gccgccggtg ccggcgaacg cgctgggcgc gcggggcgag 240  
gcggtgcggc tgcatctgca gggcgaggag ctgcggctgc aggaggagag cgtgcggctg 300  
caccagatta acatctacct cagcgaccgc atctcactgc accgccgcct gcccgagcgc 360  
tggaacccgc tgtgcaaaga gaagaaatat gattatgata atttgcccag gacatctgtt 420  
atcatagcat ttataatga agcctggtca actctccttc ggacagttta cagtgtcctt 480  
gagacatccc cggatatcct gctagaagaa gtgatacctg tagatgacta cagtgataga 540  
gagcacctga aggagcgctt ggccaatgag ctttcgggac tgcccaaggt gcgcctgata 600  
cgcgccaaca agagagaggg cctggtgcga gcccggtgc tgggggcgtc tgcggcgagg 660

ggcgatgttc tgaccttcct ggactgtcac tgtgaatgcc acgaagggtg gctggagccg 720  
 ctgctgcaga ggatccatga agaggagtcg gcagtgggtgt gcccgggtgat tgatgtgata 780  
 gactggaaca ccttcgaata cctgggggaac tccgggggagc cccagatcgg cggtttcgac 840  
 tggaggctgg tgttcacgtg gcacacagtt cctgagaggg agaggatacg gatgcaatcc 900  
 cccgtcgatg tcatcaggtc tccaacaatg gctggtgggc tgtttgctgt gagtaagaaa 960  
 tattttgaat atctgggggtc ttatgataca ggaatggaag tttggggagg agaaaacctc 1020  
 gaattttcct ttaggatctg gcagtgtggt ggggttctg aaacacaccc atgttcccat 1080  
 gttggccatg ttttcccaa gcaagctccc tactcccgca acaaggctct ggccaacagt 1140  
 gttcgtgcag ctgaagtatg gatggatgaa tttaaagagc tctactacca tcgcaacccc 1200  
 cgtgcccgtt tggaaccttt tggggatgtg acagagagga agcagctccg ggacaagctc 1260  
 cagtgtaaag acttcaagtg gttcttggag actgtgtatc cagaactgca tgtgcctgag 1320  
 gacaggcctg gcttcttcgg gatgctccag aacaaaggac taacagacta ctgctttgac 1380  
 tataaccctc ccgatgaaaa ccagattgtg ggacaccagg tcattctgta cctctgtcat 1440  
 gggatgggcc agaatcagtt tttcgagtac acgtcccaga aagaaatacg ctataacacc 1500  
 caccagcctg agggctgcat tgctgtggaa gcaggaatgg atacccttat catgcatctc 1560  
 tgcgaagaaa ctgccccaga gaatcagaag ttcattctgc aggaggatgg atctttatct 1620  
 cacgaacagt ccaagaaatg tgtccaggct gcgaggaagg agtcgagtga cagtttcgtt 1680  
 ccactcttac gagactgcac caactcggat catcagaaat ggttcttcaa agagcgcgatg 1740  
 ttatga 1746

<210> 55  
 <211> 581  
 <212> PRT  
 <213> Homo sapiens

<400> 55

Met Trp Gly Arg Thr Ala Arg Arg Arg Cys Pro Arg Glu Leu Arg Arg  
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Gly Arg Glu Ala Leu Leu Val Leu Leu Ala Leu Leu Ala Leu Ala Gly  
20 25 30

Leu Gly Ser Val Leu Arg Ala Gln Arg Gly Ala Gly Ala Gly Ala Ala  
35 40 45

Glu Pro Gly Pro Pro Arg Thr Pro Arg Pro Gly Arg Arg Glu Pro Val  
50 55 60

Met Pro Arg Pro Pro Val Pro Ala Asn Ala Leu Gly Ala Arg Gly Glu  
65 70 75 80  
22

Ala Val Arg Leu Gln Leu Gln Gly Glu Glu Leu Arg Leu Gln Glu Glu  
 85 90 95  
 Ser Val Arg Leu His Gln Ile Asn Ile Tyr Leu Ser Asp Arg Ile Ser  
 100 105 110  
 Leu His Arg Arg Leu Pro Glu Arg Trp Asn Pro Leu Cys Lys Glu Lys  
 115 120 125  
 Lys Tyr Asp Tyr Asp Asn Leu Pro Arg Thr Ser Val Ile Ile Ala Phe  
 130 135 140  
 Tyr Asn Glu Ala Trp Ser Thr Leu Leu Arg Thr Val Tyr Ser Val Leu  
 145 150 155 160  
 Glu Thr Ser Pro Asp Ile Leu Leu Glu Glu Val Ile Leu Val Asp Asp  
 165 170 175  
 Tyr Ser Asp Arg Glu His Leu Lys Glu Arg Leu Ala Asn Glu Leu Ser  
 180 185 190  
 Gly Leu Pro Lys Val Arg Leu Ile Arg Ala Asn Lys Lys Lys Gly Leu  
 195 200 205  
 Val Arg Ala Arg Leu Leu Gly Ala Ser Ala Ala Arg Gly Asp Val Leu  
 210 215 220  
 Thr Phe Leu Asp Cys His Cys Glu Cys His Glu Gly Trp Leu Glu Pro  
 225 230 235 240  
 Leu Leu Gln Arg Ile His Glu Glu Glu Ser Ala Val Val Cys Pro Val  
 245 250 255  
 Ile Asp Val Ile Asp Trp Asn Thr Phe Glu Tyr Leu Gly Asn Ser Gly  
 260 265 270  
 Glu Pro Gln Ile Gly Gly Phe Asp Trp Arg Leu Val Phe Thr Trp His  
 275 280 285  
 Thr Val Pro Glu Arg Glu Arg Ile Arg Met Gln Ser Pro Val Asp Val  
 290 295 300  
 Ile Arg Ser Pro Thr Met Ala Gly Gly Leu Phe Ala Val Ser Lys Lys  
 305 310 315 320  
 Tyr Phe Glu Tyr Leu Gly Ser Tyr Asp Thr Gly Met Glu Val Trp Gly  
 325 330 335

Gly Glu Asn Leu Glu Phe Ser Phe Arg Ile Trp Gln Cys Gly Gly Val  
 340 345 350  
 Leu Glu Thr His Pro Cys Ser His Val Gly His Phe Ser Pro Ser Lys  
 355 360 365  
 Leu Pro Thr Pro Arg Asn Lys Ala Leu Ala Asn Ser Val Arg Ala Ala  
 370 375 380  
 Glu Val Trp Met Asp Glu Phe Lys Glu Leu Tyr Tyr His Arg Asn Pro  
 385 390 395 400  
 Arg Ala Arg Leu Glu Pro Phe Gly Asp Val Thr Glu Arg Lys Gln Leu  
 405 410 415  
 Arg Asp Lys Leu Gln Cys Lys Asp Phe Lys Trp Phe Leu Glu Thr Val  
 420 425 430  
 Tyr Pro Glu Leu His Val Pro Glu Asp Arg Pro Gly Phe Phe Gly Met  
 435 440 445  
 Leu Gln Asn Lys Gly Leu Thr Asp Tyr Cys Phe Asp Tyr Asn Pro Pro  
 450 455 460  
 Asp Glu Asn Gln Ile Val Gly His Gln Val Ile Leu Tyr Leu Cys His  
 465 470 475 480  
 Gly Met Gly Gln Asn Gln Phe Phe Glu Tyr Thr Ser Gln Lys Glu Ile  
 485 490 495  
 Arg Tyr Asn Thr His Gln Pro Glu Gly Cys Ile Ala Val Glu Ala Gly  
 500 505 510  
 Met Asp Thr Leu Ile Met His Leu Cys Glu Glu Thr Ala Pro Glu Asn  
 515 520 525  
 Gln Lys Phe Ile Leu Gln Glu Asp Gly Ser Leu Phe His Glu Gln Ser  
 530 535 540  
 Lys Lys Cys Val Gln Ala Ala Arg Lys Glu Ser Ser Asp Ser Phe Val  
 545 550 555 560  
 Pro Leu Leu Arg Asp Cys Thr Asn Ser Asp His Gln Lys Trp Phe Phe  
 565 570 575  
 Lys Glu Arg Met Leu  
 580



<210> 56  
 <211> 1920  
 <212> DNA  
 <213> Homo sapiens

<400> 56  
 atgctcctaa ggaagcgata caggcacaga ccatgcagac tccagttcct cctgctgctc 60  
 ctgatgctgg gatgcgtcct gatgatggtg gcgatgttgc accctcccca ccacaccctg 120  
 caccagactg tcacagccca agccagcaag cacagccctg aagccaggta ccgcctggac 180  
 tttggggaat cccaggattg ggtactggaa gctgaggatg aggggtgaaga gtacagccct 240  
 ctggagggcc tgccaccctt tatctcactg cgggaggatc agctgctggt ggccgtggcc 300  
 ttaccccagg ccagaaggaa ccagagccag ggcaggagag gtgggagcta ccgcctcatc 360  
 aagcagccaa ggaggcagga taaggaagcc ccaaagaggg actggggggc tgatgaggac 420  
 ggggaggtgt ctgaagaaga ggagttgacc ccgttcagcc tggaccacg tggcctccag 480  
 gaggcactca gtgcccgcct cccctccag agggctctgc ccgaggtgcg gcaccactg 540  
 tgtctgcagc agcaccctca ggacagcctg cccacagcca gcgtcatcct ctgtttccat 600  
 gatgaggcct ggtccactct cctgcggact gtacacagca tcctcgacac agtgcccagg 660  
 gccttcctga aggagatcat cctcgtggac gacctcagcc agcaaggaca actcaagtct 720  
 gctctcagcg aatatgtggc caggctggag ggggtgaagt tactcaggag caacaagagg 780  
 ctgggtgccca tcagggcccg gatgctgggg gccaccagag ccaccgggga tgtgctcgtc 840  
 ttcattgatg cccactgcga gtgccaccca ggctggctgg agccccctct cagcagaata 900  
 gctggtgaca ggagccgagt ggtatctccg gtgatagatg tgattgactg gaagactttc 960  
 cagtattacc cctcaaagga cctgcagcgt ggggtgttgg actggaagct ggattttcac 1020  
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 agccctgtgg tgcccggaga ggtggtggcc atggacagac attacttcca aaacactgga 1140  
 gcgtatgact ctcttatgtc gctgcgaggt ggtgaaaacc tcgaactgtc tttcaaggcc 1200  
 tggctctgtg gtggctctgt tgaaatcctt ccctgctctc gggtaggaca catctaccaa 1260  
 aatcaggatt cccattcccc cctcgaccag gaggccaccc tgaggaacag ggttcgcatt 1320  
 gctgagacct ggctggggtc attcaaagaa accttctaca agcatagccc agaggccttc 1380  
 tccttgagca aggctgagaa gccagactgc atggaacgct tgcagctgca aaggagactg 1440  
 ggttgtcgga cattccactg gtttctggct aatgtctacc ctgagctgta cccatctgaa 1500  
 cccaggccca gtttctctgg aaagctccac aacactggac ttgggctctg tgcagactgc 1560  
 caggcagaag gggacatcct gggctgtccc atggtgttgg ctccttgagc tgacagccgg 1620  
 cagcaacagt acctgcagca caccagcagg aaggagattc actttggcag cccacagcac 1680

ctgtgctttg ctgtcaggca ggagcaggtg attcttcaga actgcacgga ggaaggcctg 1740  
gccatccacc agcagcactg ggacttccag gagaatggga tgattgtcca cattctttct 1800  
gggaaatgca tggaagctgt ggtgcaagaa aacaataaag atttgtacct gcgtccgtgt 1860  
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<210> 57  
<211> 639  
<212> PRT  
<213> Homo sapiens

<400> 57

Met Leu Leu Arg Lys Arg Tyr Arg His Arg Pro Cys Arg Leu Gln Phe  
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Leu Leu Leu Leu Leu Met Leu Gly Cys Val Leu Met Met Val Ala Met  
20 25 30

Leu His Pro Pro His His Thr Leu His Gln Thr Val Thr Ala Gln Ala  
35 40 45

Ser Lys His Ser Pro Glu Ala Arg Tyr Arg Leu Asp Phe Gly Glu Ser  
50 55 60

Gln Asp Trp Val Leu Glu Ala Glu Asp Glu Gly Glu Glu Tyr Ser Pro  
65 70 75 80

Leu Glu Gly Leu Pro Pro Phe Ile Ser Leu Arg Glu Asp Gln Leu Leu  
85 90 95

Val Ala Val Ala Leu Pro Gln Ala Arg Arg Asn Gln Ser Gln Gly Arg  
100 105 110

Arg Gly Gly Ser Tyr Arg Leu Ile Lys Gln Pro Arg Arg Gln Asp Lys  
115 120 125

Glu Ala Pro Lys Arg Asp Trp Gly Ala Asp Glu Asp Gly Glu Val Ser  
130 135 140

Glu Glu Glu Glu Leu Thr Pro Phe Ser Leu Asp Pro Arg Gly Leu Gln  
145 150 155 160

Glu Ala Leu Ser Ala Arg Ile Pro Leu Gln Arg Ala Leu Pro Glu Val  
165 170 175

Arg His Pro Leu Cys Leu Gln Gln His Pro Gln Asp Ser Leu Pro Thr  
180 185 190

Ala Ser Val Ile Leu Cys Phe His Asp Glu Ala Trp Ser Thr Leu Leu  
195 200 205  
Arg Thr Val His Ser Ile Leu Asp Thr Val Pro Arg Ala Phe Leu Lys  
210 215 220  
Glu Ile Ile Leu Val Asp Asp Leu Ser Gln Gln Gly Gln Leu Lys Ser  
225 230 235 240  
Ala Leu Ser Glu Tyr Val Ala Arg Leu Glu Gly Val Lys Leu Leu Arg  
245 250 255  
Ser Asn Lys Arg Leu Gly Ala Ile Arg Ala Arg Met Leu Gly Ala Thr  
260 265 270  
Arg Ala Thr Gly Asp Val Leu Val Phe Met Asp Ala His Cys Glu Cys  
275 280 285  
His Pro Gly Trp Leu Glu Pro Leu Leu Ser Arg Ile Ala Gly Asp Arg  
290 295 300  
Ser Arg Val Val Ser Pro Val Ile Asp Val Ile Asp Trp Lys Thr Phe  
305 310 315 320  
Gln Tyr Tyr Pro Ser Lys Asp Leu Gln Arg Gly Val Leu Asp Trp Lys  
325 330 335  
Leu Asp Phe His Trp Glu Pro Leu Pro Glu His Val Arg Lys Ala Leu  
340 345 350  
Gln Ser Pro Ile Ser Pro Ile Arg Ser Pro Val Val Pro Gly Glu Val  
355 360 365  
Val Ala Met Asp Arg His Tyr Phe Gln Asn Thr Gly Ala Tyr Asp Ser  
370 375 380  
Leu Met Ser Leu Arg Gly Gly Glu Asn Leu Glu Leu Ser Phe Lys Ala  
385 390 395 400  
Trp Leu Cys Gly Gly Ser Val Glu Ile Leu Pro Cys Ser Arg Val Gly  
405 410 415  
His Ile Tyr Gln Asn Gln Asp Ser His Ser Pro Leu Asp Gln Glu Ala  
420 425 430  
Thr Leu Arg Asn Arg Val Arg Ile Ala Glu Thr Trp Leu Gly Ser Phe  
435 440 445

Lys Glu Thr Phe Tyr Lys His Ser Pro Glu Ala Phe Ser Leu Ser Lys  
450 455 460

Ala Glu Lys Pro Asp Cys Met Glu Arg Leu Gln Leu Gln Arg Arg Leu  
465 470 475 480

Gly Cys Arg Thr Phe His Trp Phe Leu Ala Asn Val Tyr Pro Glu Leu  
485 490 495

Tyr Pro Ser Glu Pro Arg Pro Ser Phe Ser Gly Lys Leu His Asn Thr  
500 505 510

Gly Leu Gly Leu Cys Ala Asp Cys Gln Ala Glu Gly Asp Ile Leu Gly  
515 520 525

Cys Pro Met Val Leu Ala Pro Cys Ser Asp Ser Arg Gln Gln Gln Tyr  
530 535 540

Leu Gln His Thr Ser Arg Lys Glu Ile His Phe Gly Ser Pro Gln His  
545 550 555 560

Leu Cys Phe Ala Val Arg Gln Glu Gln Val Ile Leu Gln Asn Cys Thr  
565 570 575

Glu Glu Gly Leu Ala Ile His Gln Gln His Trp Asp Phe Gln Glu Asn  
580 585 590

Gly Met Ile Val His Ile Leu Ser Gly Lys Cys Met Glu Ala Val Val  
595 600 605

Gln Glu Asn Asn Lys Asp Leu Tyr Leu Arg Pro Cys Asp Gly Lys Ala  
610 615 620

Arg Gln Gln Trp Arg Phe Asp Gln Ile Asn Ala Val Asp Glu Arg  
625 630 635

<210> 58  
<211> 1671  
<212> DNA  
<213> Homo sapiens

<400> 58  
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tctctgctgc ctgcattgag ggctgttatt tcaagaaacc aagaagggcc aggagaaatg 180  
ggaaaagctg tgttgattcc taaagatgac caggagaaaa tgaaagagct gtttaaaatc 240  
aatcagttta accttatggc cagtgatttg attgccctta atagaagtct gccagatgta 300

agattagaag gatgtaagac aaaagtctac cctgatgaac ttccaaacac aagtgtagtc 360  
 attgtgtttc ataatgaagc ttggagcact ctccttagaa ctgtttacag tgtgataaat 420  
 cgttccccac actatctact ctgagaggtc atcttggttag atgatgccag tgaaagagat 480  
 tttctcaagt tgacattaga gaattacgtg aaaaatttag aagtgccagt aaaaattatt 540  
 aggatggaag aacgctctgg gttaatacgt gcccgtcttc gaggagcagc tgcttcaaaa 600  
 gggcagggtca taacttttct tgatgcacac tgtgaatgca cgtaggatg gctggagcct 660  
 ttgctggcaa gaataaagga agacaggaaa acggttgtct gccctatcat tgatgtgatt 720  
 agtgatgata cttttgaata tatggctggg tcagacatga cttatggggg ttttaactgg 780  
 aaactgaatt tccgctggta tcctgttccc caaagagaaa tggacaggag gaaaggagac 840  
 agaacattac ctgtcaggac ccctactatg gctgggtggc tattttctat tgacagaaac 900  
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 gaaatgtctt ttaggatttg gcaatgtgga ggctccttg agattgttac ttgctcccat 1020  
 gttggtcatg tttttcgaa ggcaactcca tacacttttc ctggtggcac tggcatgtc 1080  
 atcaacaaga acaacaggag actggcagaa gtttggatgg atgaatttaa agatttcttc 1140  
 tacatcatat ccccagggtg tgtcaaagtg gattatggag atgtgtcagt cagaaaaaca 1200  
 ctaagagaaa atctgaagtg taagcccttt tcttggtacc tagaaaacat ctatccggac 1260  
 tcccagatcc caagacgtta ttactcactt ggtgagataa gaaatgttga aaccaatcag 1320  
 tgttttagaca acatgggccg caaggaaaat gaaaaagtgg gtatattcaa ctgtcatggg 1380  
 atgggaggaa atcagggtatt ttcttacct gctgacaaag aaatccgaac cgatgacttg 1440  
 tgcttgatg tttctagact caatggacct gtaatcatgt taaaatgcca ccatatgaga 1500  
 ggaaatcagt tatgggaata tgatgctgag agactcacgt tgcgacatgt taacagtaac 1560  
 caatgtctcg atgaaccttc tgaagaagac aaaatgggtc ctacaatgca ggactgtagt 1620  
 ggaagcagat cccaacagtg gctgctaagg aacatgacct tgggcacatg a 1671

<210> 59  
 <211> 556  
 <212> PRT  
 <213> Homo sapiens  
 <400> 59

Met Arg Arg Phe Val Tyr Cys Lys Val Val Leu Ala Thr Ser Leu Met  
1 5 10 15

Trp Val Leu Val Asp Val Phe Leu Leu Leu Tyr Phe Ser Glu Cys Asn  
20 25 30

Lys Cys Asp Asp Lys Lys Glu Arg Ser Leu Leu Pro Ala Leu Arg Ala  
35 40 45

Val Ile Ser Arg Asn Gln Glu Gly Pro Gly Glu Met Gly Lys Ala Val  
 50 55 60

Leu Ile Pro Lys Asp Asp Gln Glu Lys Met Lys Glu Leu Phe Lys Ile  
 65 70 75 80

Asn Gln Phe Asn Leu Met Ala Ser Asp Leu Ile Ala Leu Asn Arg Ser  
 85 90 95

Leu Pro Asp Val Arg Leu Glu Gly Cys Lys Thr Lys Val Tyr Pro Asp  
 100 105 110

Glu Leu Pro Asn Thr Ser Val Val Ile Val Phe His Asn Glu Ala Trp  
 115 120 125

Ser Thr Leu Leu Arg Thr Val Tyr Ser Val Ile Asn Arg Ser Pro His  
 130 135 140

Tyr Leu Leu Ser Glu Val Ile Leu Val Asp Asp Ala Ser Glu Arg Asp  
 145 150 155 160

Phe Leu Lys Leu Thr Leu Glu Asn Tyr Val Lys Asn Leu Glu Val Pro  
 165 170 175

Val Lys Ile Ile Arg Met Glu Glu Arg Ser Gly Leu Ile Arg Ala Arg  
 180 185 190

Leu Arg Gly Ala Ala Ala Ser Lys Gly Gln Val Ile Thr Phe Leu Asp  
 195 200 205

Ala His Cys Glu Cys Thr Leu Gly Trp Leu Glu Pro Leu Leu Ala Arg  
 210 215 220

Ile Lys Glu Asp Arg Lys Thr Val Val Cys Pro Ile Ile Asp Val Ile  
 225 230 235 240

Ser Asp Asp Thr Phe Glu Tyr Met Ala Gly Ser Asp Met Thr Tyr Gly  
 245 250 255

Gly Phe Asn Trp Lys Leu Asn Phe Arg Trp Tyr Pro Val Pro Gln Arg  
 260 265 270

Glu Met Asp Arg Arg Lys Gly Asp Arg Thr Leu Pro Val Arg Thr Pro  
 275 280 285

Thr Met Ala Gly Gly Leu Phe Ser Ile Asp Arg Asn Tyr Phe Glu Glu  
 290 295 300

Ile Gly Thr Tyr Asp Ala Gly Met Asp Ile Trp Gly Gly Glu Asn Leu  
305 310 315 320

Glu Met Ser Phe Arg Ile Trp Gln Cys Gly Gly Ser Leu Glu Ile Val  
325 330 335

Thr Cys Ser His Val Gly His Val Phe Arg Lys Ala Thr Pro Tyr Thr  
340 345 350

Phe Pro Gly Gly Thr Gly His Val Ile Asn Lys Asn Asn Arg Arg Leu  
355 360 365

Ala Glu Val Trp Met Asp Glu Phe Lys Asp Phe Phe Tyr Ile Ile Ser  
370 375 380

Pro Gly Val Val Lys Val Asp Tyr Gly Asp Val Ser Val Arg Lys Thr  
385 390 395 400

Leu Arg Glu Asn Leu Lys Cys Lys Pro Phe Ser Trp Tyr Leu Glu Asn  
405 410 415

Ile Tyr Pro Asp Ser Gln Ile Pro Arg Arg Tyr Tyr Ser Leu Gly Glu  
420 425 430

Ile Arg Asn Val Glu Thr Asn Gln Cys Leu Asp Asn Met Gly Arg Lys  
435 440 445

Glu Asn Glu Lys Val Gly Ile Phe Asn Cys His Gly Met Gly Gly Asn  
450 455 460

Gln Val Phe Ser Tyr Thr Ala Asp Lys Glu Ile Arg Thr Asp Asp Leu  
465 470 475 480

Cys Leu Asp Val Ser Arg Leu Asn Gly Pro Val Ile Met Leu Lys Cys  
485 490 495

His His Met Arg Gly Asn Gln Leu Trp Glu Tyr Asp Ala Glu Arg Leu  
500 505 510

Thr Leu Arg His Val Asn Ser Asn Gln Cys Leu Asp Glu Pro Ser Glu  
515 520 525

Glu Asp Lys Met Val Pro Thr Met Gln Asp Cys Ser Gly Ser Arg Ser  
530 535 540

Gln Gln Trp Leu Leu Arg Asn Met Thr Leu Gly Thr  
545 550 555  
31

<210> 60  
 <211> 1911  
 <212> DNA  
 <213> Homo sapiens

<400> 60  
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 ctgctgtttct tctgggtaac caagaggaag ttggaggtgc cgacgggacc tgaagtgcag 120  
 acccctaagc cttcggacgc tgactgggac gacctgtggg accagtttga tgagcggcgg 180  
 tatctgaatg ccaaaaagtg gcgcgttggt gacgaccctc ataagctgta tgctttcaac 240  
 cagcgggaga gtgagcggat ctccagcaat cgggccatcc cggacactcg ccatctgaga 300  
 tgcacactgc tgggtgtattg cacggacctt ccaccacta gcatcatcat caccttccac 360  
 aacgaagccc gctccacgct gctcaggacc atccgcagtg tattaaccg caccctacg 420  
 catctgatcc gggaaatcat attagtggat gacttcagca atgaccctga tgactgtaaa 480  
 cagctcatca aattgcccaa ggtgaaatgc ttgcgcaata atgaacggca aggtctggtc 540  
 cgggtcccga ttcggggcgc tgacatcgcc cagggcacca ctctgacttt cctcgacagc 600  
 cactgtgagg tgaacaggga ctggctccag cctctgttgc acaggggtcaa agaagactac 660  
 acgcgggtgg tgtgccctgt gatcgatatt attaacctgg acaccttcac ctacatcgag 720  
 tctgcctcgg agctcagagg ggggtttgac tggagcctcc acttccagtg ggagcagctc 780  
 tccccagagc agaagctcgg cgcctggacc ccacggaagc ccatcaggac tcctatcata 840  
 gctggagggc tcttcgtgat cgacaaagct tggtttgatt acctggggaa atatgatattg 900  
 gacatggaca tctgggggtg ggagaacttt gaaatctcct tccgagtgtg gatgtgcggg 960  
 ggcagcctag agatcgctcc ctgcagccga gtggggcacg tcttccggaa gaagcacccc 1020  
 tacgttttcc ctgatggaaa tgccaacacg tatataaaga acaccaagcg gacagctgaa 1080  
 gtgtggatgg atgaatacaa gcaatactat tacgctgccc ggccattcgc cctggagagg 1140  
 cccttcggga atgttgagag cagattggac ctgaggaaga atctgcgctg ccagagcttc 1200  
 aagtgggtacc tggagaatat ctaccctgaa ctgagcatcc ccaaggagtc ctccatccag 1260  
 aagggcaata tccgacagag acagaagtgc ctggaatctc aaaggcagaa caaccaagaa 1320  
 accccaaacc taaagttgag cccctgtgcc aaggtcaaag gcgaagatgc aaagtcccag 1380  
 gtatgggcct tcacatacac ccagcagatc ctccaggagg agctgtgcct gtcagtcatc 1440  
 acctgtttcc ctggcgcccc agtggttctt gtcctttgca agaattggaga tgaccgacag 1500  
 caatggacca aaactggttc ccacatcgag cacatagcat cccacctctg cctcgatata 1560  
 gatatgttcg gtgatggcac cgagaacggc aaggaaatcg tcgtcaaccc atgtgagtc 1620  
 tcatcatga gccagcactg ggacatggtg agctcttgag gaccctgcc agaagcagca 1680



agggccatgg ggtggtgctt ccctggacca gaacagactg gaaactgggc agcaagcagc 1740  
 ctgcaaccac ctcagacatc ctggactggg aggtggaggc agagcccccc aggacaggag 1800  
 caactgtctc agggaggaca gaggaaaaca tcacaagcca atggggctca aagacaaatc 1860  
 ccacatgttc tcaaggccgt taagttccag tcctggccag tcattccctg a 1911

<210> 61  
 <211> 552  
 <212> PRT  
 <213> Homo sapiens

<400> 61

Met Arg Arg Leu Thr Arg Arg Leu Val Leu Pro Val Phe Gly Val Leu  
1 5 10 15

Trp Ile Thr Val Leu Leu Phe Phe Trp Val Thr Lys Arg Lys Leu Glu  
20 25 30

Val Pro Thr Gly Pro Glu Val Gln Thr Pro Lys Pro Ser Asp Ala Asp  
35 40 45

Trp Asp Asp Leu Trp Asp Gln Phe Asp Glu Arg Arg Tyr Leu Asn Ala  
50 55 60

Lys Lys Trp Arg Val Gly Asp Asp Pro Tyr Lys Leu Tyr Ala Phe Asn  
65 70 75 80

Gln Arg Glu Ser Glu Arg Ile Ser Ser Asn Arg Ala Ile Pro Asp Thr  
85 90 95

Arg His Leu Arg Cys Thr Leu Leu Val Tyr Cys Thr Asp Leu Pro Pro  
100 105 110

Thr Ser Ile Ile Ile Thr Phe His Asn Glu Ala Arg Ser Thr Leu Leu  
115 120 125

Arg Thr Ile Arg Ser Val Leu Asn Arg Thr Pro Thr His Leu Ile Arg  
130 135 140

Glu Ile Ile Leu Val Asp Asp Phe Ser Asn Asp Pro Asp Asp Cys Lys  
145 150 155 160

Gln Leu Ile Lys Leu Pro Lys Val Lys Cys Leu Arg Asn Asn Glu Arg  
165 170 175

Gln Gly Leu Val Arg Ser Arg Ile Arg Gly Ala Asp Ile Ala Gln Gly  
180 185 190

Thr Thr Leu Thr Phe Leu Asp Ser His Cys Glu Val Asn Arg Asp Trp  
 195 200 205  
 Leu Gln Pro Leu Leu His Arg Val Lys Glu Asp Tyr Thr Arg Val Val  
 210 215 220  
 Cys Pro Val Ile Asp Ile Ile Asn Leu Asp Thr Phe Thr Tyr Ile Glu  
 225 230 235 240  
 Ser Ala Ser Glu Leu Arg Gly Gly Phe Asp Trp Ser Leu His Phe Gln  
 245 250 255  
 Trp Glu Gln Leu Ser Pro Glu Gln Lys Leu Gly Ala Trp Thr Pro Arg  
 260 265 270  
 Lys Pro Ile Arg Thr Pro Ile Ile Ala Gly Gly Leu Phe Val Ile Asp  
 275 280 285  
 Lys Ala Trp Phe Asp Tyr Leu Gly Lys Tyr Asp Met Asp Met Asp Ile  
 290 295 300  
 Trp Gly Gly Glu Asn Phe Glu Ile Ser Phe Arg Val Trp Met Cys Gly  
 305 310 315 320  
 Gly Ser Leu Glu Ile Val Pro Cys Ser Arg Val Gly His Val Phe Arg  
 325 330 335  
 Lys Lys His Pro Tyr Val Phe Pro Asp Gly Asn Ala Asn Thr Tyr Ile  
 340 345 350  
 Lys Asn Thr Lys Arg Thr Ala Glu Val Trp Met Asp Glu Tyr Lys Gln  
 355 360 365  
 Tyr Tyr Tyr Ala Ala Arg Pro Phe Ala Leu Glu Arg Pro Phe Gly Asn  
 370 375 380  
 Val Glu Ser Arg Leu Asp Leu Arg Lys Asn Leu Arg Cys Gln Ser Phe  
 385 390 395 400  
 Lys Trp Tyr Leu Glu Asn Ile Tyr Pro Glu Leu Ser Ile Pro Lys Glu  
 405 410 415  
 Ser Ser Ile Gln Lys Gly Asn Ile Arg Gln Arg Gln Lys Cys Leu Glu  
 420 425 430  
 Ser Gln Arg Gln Asn Asn Gln Glu Thr Pro Asn Leu Lys Leu Ser Pro  
 435 440 445

Cys Ala Lys Val Lys Gly Glu Asp Ala Lys Ser Gln Val Trp Ala Phe  
 450 455 460

Thr Tyr Thr Gln Gln Ile Leu Gln Glu Glu Leu Cys Leu Ser Val Ile  
 465 470 475 480

Thr Leu Phe Pro Gly Ala Pro Val Val Leu Val Leu Cys Lys Asn Gly  
 485 490 495

Asp Asp Arg Gln Gln Trp Thr Lys Thr Gly Ser His Ile Glu His Ile  
 500 505 510

Ala Ser His Leu Cys Leu Asp Thr Asp Met Phe Gly Asp Gly Thr Glu  
 515 520 525

Asn Gly Lys Glu Ile Val Val Asn Pro Cys Glu Ser Ser Leu Met Ser  
 530 535 540

Gln His Trp Asp Met Val Ser Ser  
 545 550

<210> 62  
 <211> 1677  
 <212> DNA  
 <213> Homo sapiens

<400> 62  
 atgaggaaga tccgcgccaa tgccatcgcc atcctgaccg tagcctggat cctgggcact 60  
 ttctactact tatggcagga caaccgagcc cacgcagcat cctccggcgg ccggggcgcg 120  
 cagagggcag gcaggaggtc ggagcagctc cgcgaggacc gcaccatccc gctcattgtg 180  
 acaggaactc cctcgaaagg ctttgatgag aaggcctacc tgtcggccaa gcagctgaag 240  
 gctggagagg acccctacag acagcacgcc ttcaaccagc tggagagtga caagctgagc 300  
 ccagaccggc ccatccggga caccgccat tacagctgcc catctgtgtc ctactcctcg 360  
 gacctgccag ccaccagcgt catcatcacc ttccacaatg aggcccgttc caccctgctg 420  
 cgcacagtga agagtgtcct gaaccgaact cctgccaaact tgatccagga gatcatttta 480  
 gtggatgact tcagctcaga tccggaagac tgtctactcc tgaccaggat cccaaggtc 540  
 aagtgcctgc gcaatgatcg gcgggaaggg ctgatccggc cccgagtgcg tggggcggac 600  
 gtggctgcag ctaccgttct cacctttctg gatagccact gcgaagtga caccgagtgg 660  
 ctgccgcca tgctgcagcg ggtgaaggag gaccacacc gcgtggtgag tcccatcatt 720  
 gatgtcatca gtctggataa ttttgcttac cttgcagcat ctgctgacct tcgtggaggg 780  
 ttcgactgga gcctgcattt caagtgggag cagatccctc ttgagcagaa gatgaccggg 840  
 acagacccca ccaggcccat aaggacgcct gtcatagctg gaggaatctt cgtgatcgac 900

aagtcctggt ttaaccactt gggaaagtat gatgcccaga tggacatctg ggggggagag 960  
aattttgagc tctccttcag ggtgtggatg tgtggtggca gtctggagat cgtcccctgc 1020  
agccgggtgg gccatgtctt caggaaacgg caccctaca acttccctga gggtaatgcc 1080  
ctcacctaca tcaggaatac taagcgact gcagaagtgt ggatggatga atacaagcaa 1140  
tactactatg aggcccggcc ctcgccatc gggaaggcct tcggcagtgt ggctacgcgg 1200  
atagagcaga ggaagaagat gaactgcaag tccttccgct ggtacctgga gaacgtctac 1260  
ccagagctca cggccccgt gaaggaagca ctccccggca tcattaagca gggggtgaac 1320  
tgcttagaat ctcaggcca gaacacagct ggtgacttcc tgcttggat ggggatctgc 1380  
agaggggtctg ccaagaaccc gcagcccgcc caggcatggc tgttcagtga ccacctcatc 1440  
cagcagcagg ggaagtgcct ggctgccacc tccaccttaa tgcctcccc tggatcccca 1500  
gtcatactgc agatgtgcaa ccctagagaa ggcaagcaga aatggaggag aaaaggatct 1560  
ttcatccagc attcagtcag tggcctctgc ctggagacaa agcctgcccc gctggtgacc 1620  
agcaagtgtc aggctgacgc ccaggcccag cagtggcagc tgttgccaca cacatga 1677

<210> 63  
<211> 558  
<212> PRT  
<213> Homo sapiens

<400> 63

Met Arg Lys Ile Arg Ala Asn Ala Ile Ala Ile Leu Thr Val Ala Trp  
1 5 10 15

Ile Leu Gly Thr Phe Tyr Tyr Leu Trp Gln Asp Asn Arg Ala His Ala  
20 25 30

Ala Ser Ser Gly Gly Arg Gly Ala Gln Arg Ala Gly Arg Arg Ser Glu  
35 40 45

Gln Leu Arg Glu Asp Arg Thr Ile Pro Leu Ile Val Thr Gly Thr Pro  
50 55 60

Ser Lys Gly Phe Asp Glu Lys Ala Tyr Leu Ser Ala Lys Gln Leu Lys  
65 70 75 80

Ala Gly Glu Asp Pro Tyr Arg Gln His Ala Phe Asn Gln Leu Glu Ser  
85 90 95

Asp Lys Leu Ser Pro Asp Arg Pro Ile Arg Asp Thr Arg His Tyr Ser  
100 105 110

Cys Pro Ser Val Ser Tyr Ser Ser Asp Leu Pro Ala Thr Ser Val Ile  
115 120 125

Ile Thr Phe His Asn Glu Ala Arg Ser Thr Leu Leu Arg Thr Val Lys  
 130 135 140  
 Ser Val Leu Asn Arg Thr Pro Ala Asn Leu Ile Gln Glu Ile Ile Leu  
 145 150 155 160  
 Val Asp Asp Phe Ser Ser Asp Pro Glu Asp Cys Leu Leu Leu Thr Arg  
 165 170 175  
 Ile Pro Lys Val Lys Cys Leu Arg Asn Asp Arg Arg Glu Gly Leu Ile  
 180 185 190  
 Arg Ser Arg Val Arg Gly Ala Asp Val Ala Ala Ala Thr Val Leu Thr  
 195 200 205  
 Phe Leu Asp Ser His Cys Glu Val Asn Thr Glu Trp Leu Pro Pro Met  
 210 215 220  
 Leu Gln Arg Val Lys Glu Asp His Thr Arg Val Val Ser Pro Ile Ile  
 225 230 235 240  
 Asp Val Ile Ser Leu Asp Asn Phe Ala Tyr Leu Ala Ala Ser Ala Asp  
 245 250 255  
 Leu Arg Gly Gly Phe Asp Trp Ser Leu His Phe Lys Trp Glu Gln Ile  
 260 265 270  
 Pro Leu Glu Gln Lys Met Thr Arg Thr Asp Pro Thr Arg Pro Ile Arg  
 275 280 285  
 Thr Pro Val Ile Ala Gly Gly Ile Phe Val Ile Asp Lys Ser Trp Phe  
 290 295 300  
 Asn His Leu Gly Lys Tyr Asp Ala Gln Met Asp Ile Trp Gly Gly Glu  
 305 310 315 320  
 Asn Phe Glu Leu Ser Phe Arg Val Trp Met Cys Gly Gly Ser Leu Glu  
 325 330 335  
 Ile Val Pro Cys Ser Arg Val Gly His Val Phe Arg Lys Arg His Pro  
 340 345 350  
 Tyr Asn Phe Pro Glu Gly Asn Ala Leu Thr Tyr Ile Arg Asn Thr Lys  
 355 360 365  
 Arg Thr Ala Glu Val Trp Met Asp Glu Tyr Lys Gln Tyr Tyr Tyr Glu  
 370 375 380

Ala Arg Pro Ser Ala Ile Gly Lys Ala Phe Gly Ser Val Ala Thr Arg  
385 390 395 400

Ile Glu Gln Arg Lys Lys Met Asn Cys Lys Ser Phe Arg Trp Tyr Leu  
405 410 415

Glu Asn Val Tyr Pro Glu Leu Thr Val Pro Val Lys Glu Ala Leu Pro  
420 425 430

Gly Ile Ile Lys Gln Gly Val Asn Cys Leu Glu Ser Gln Gly Gln Asn  
435 440 445

Thr Ala Gly Asp Phe Leu Leu Gly Met Gly Ile Cys Arg Gly Ser Ala  
450 455 460

Lys Asn Pro Gln Pro Ala Gln Ala Trp Leu Phe Ser Asp His Leu Ile  
465 470 475 480

Gln Gln Gln Gly Lys Cys Leu Ala Ala Thr Ser Thr Leu Met Ser Ser  
485 490 495

Pro Gly Ser Pro Val Ile Leu Gln Met Cys Asn Pro Arg Glu Gly Lys  
500 505 510

Gln Lys Trp Arg Arg Lys Gly Ser Phe Ile Gln His Ser Val Ser Gly  
515 520 525

Leu Cys Leu Glu Thr Lys Pro Ala Gln Leu Val Thr Ser Lys Cys Gln  
530 535 540

Ala Asp Ala Gln Ala Gln Gln Trp Gln Leu Leu Pro His Thr  
545 550 555

<210> 64  
<211> 33  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 64  
caaaggaagc ttatggagat atatcgtaa gag

33

<210> 65  
<211> 43  
<212> DNA  
<213> Artificial Sequence

<220>

<223> PCR primer  
 <400> 65  
 gcaagctcga ggcggccgct cagaatattt ctggaagggt gac 43  
  
 <210> 66  
 <211> 37  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 66  
 caaggaagct tcttatggaa atattcagag cagattg 37  
  
 <210> 67  
 <211> 38  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 67  
 gcaagctcga ggcggccgcc tactgctgca gggtgagc 38  
  
 <210> 68  
 <211> 37  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 68  
 caaggaagct tcatttggtg atctttcaaa aagattt 37  
  
 <210> 69  
 <211> 40  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 69  
 gcaagctcga ggcggccgca ggaacactta atcattttgg 40  
  
 <210> 70  
 <211> 28  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 70  
 agaaaagaag cttatggtga tatttctg 28

<210> 71  
<211> 28  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 71  
agcggatccg acgaagtgct gttgtgct

28

<210> 72  
<211> 35  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 72  
caaggaagct ttagatgttg gcaacctcac ccagc

35

<210> 73  
<211> 44  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 73  
gcaagctcga ggcggccgca agcatcagtt acacttcagg cttc

44

<210> 74  
<211> 33  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 74  
caaggaagct tccttcggtg acatttcgga acg

33

<210> 75  
<211> 39  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 75  
gcaagctcga ggcggccgct gggtcctaga caaagagcc

39

<210> 76  
<211> 33



<212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> PCR primer  
 <400> 76  
 agaaaagaag cttatgggga tatatcggag ctg 33

<210> 77  
 <211> 44  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> PCR primer  
 <400> 77  
 gcaagctcga ggcggccgct ctctaaacac tatggatggtt attc 44

<210> 78  
 <211> 34  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> PCR primer  
 <400> 78  
 caaggaagct tttggagacg tttcttccag aatg 34

<210> 79  
 <211> 42  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> PCR primer  
 <400> 79  
 gcaagctcga ggcggccgct cactggctgt tggctctgacc cc 42

<210> 80  
 <211> 34  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> PCR primer  
 <400> 80  
 caaggaagct ttcggggacg tgtctgagag gctg 34

<210> 81  
 <211> 42  
 <212> DNA  
 <213> Artificial Sequence  
 <220>

<223> PCR primer  
 <400> 81  
 gcaagctcga ggcggccgct cagtgccgtg cgtgtttgat cc 42  
  
 <210> 82  
 <211> 34  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 82  
 caaggaagct tccgctgggg atgtcgcagt ccag 34  
  
 <210> 83  
 <211> 41  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 83  
 gcaagctcga ggcggccgct cagttcctat tgaatttttc c 41  
  
 <210> 84  
 <211> 32  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 84  
 caaggaagct tgcaatatca gtgagcgtgt gg 32  
  
 <210> 85  
 <211> 40  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 85  
 gcaagctcga ggcggccgcc caccttaacc ttccaaatgc 40  
  
 <210> 86  
 <211> 31  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> PCR primer  
  
 <400> 86  
 caaggaagct tgggatgtga cagagaggaa g 31

<210> 87  
<211> 45  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 87  
gcaagctcga ggcggccgct cataacatgc gctctttgaa gaacc

45

<210> 88  
<211> 32  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 88  
caaggaagct tctgagaagc cagactgcat gg

32

<210> 89  
<211> 41  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 89  
gcaagctcga ggcggccgct catcgttcat ccacagcatt g

41

<210> 90  
<211> 36  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 90  
caaggaagct tatggagatg tgtcagtcag aaaaac

36

<210> 91  
<211> 42  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> PCR primer

<400> 91  
gcaagctcga ggcggccgct catgtgccca aggtcatgtt cc

42

<210> 92  
<211> 34

<212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> PCR primer  
 <400> 92  
 caaggaagct ttcgggaatg ttgagagcag attg 34

<210> 93  
 <211> 43  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> PCR primer  
 <400> 93  
 gcaagctcga ggcggccgct caagaactca ccatgtccca gtg 43

<210> 94  
 <211> 40  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> PCR primer  
 <400> 94  
 caaggaagct tgcagtgtgg ctacgcggat agagcagagg 40

<210> 95  
 <211> 42  
 <212> DNA  
 <213> Artificial Sequence  
 <220>  
 <223> PCR primer  
 <400> 95  
 gcaagctcga ggcggccgct catgtgtgtg gcaacagctg cc 42

<210> 96  
 <211> 513  
 <212> DNA  
 <213> Homo sapiens  
 <400> 96  
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 cctttttcct ggtacctaga gaatatatat cctgattctc aaattccacg tcactatttc 120  
 tcattgggag agatacgaag tgtggaaacg aatcagtgtc tagataacat ggctagaaaa 180  
 gagaatgaaa aagttggaat ttttaattgc catggtatgg ggggtaatca ggttttctct 240  
 tatactgcc acaaagaaat tagaacagat gacctttgct tggatgtttc caaacttaat 300  
 ggcccagtta caatgctcaa atgccaccac ctaaaaggca accaactctg ggagtatgac 360

ccagtgaat taaccctgca gcatgtgaac agtaatcagt gcctggataa agccacagaa 420  
gaggatagcc aggtgcccag cattagagac tgcaatggaa gtcggtccca gcagtggctt 480  
cttcgaaacg tcacccttcc agaaatattc tga 513

<210> 97  
<211> 167  
<212> PRT  
<213> Homo sapiens

<400> 97

Tyr Gly Asp Ile Ser Ser Arg Val Gly Leu Arg His Lys Leu Gln Cys  
1 5 10 15

Lys Pro Phe Ser Trp Tyr Leu Glu Asn Ile Tyr Pro Asp Ser Gln Ile  
20 25 30

Pro Arg His Tyr Phe Ser Leu Gly Glu Ile Arg Asn Val Glu Thr Asn  
35 40 45

Gln Cys Leu Asp Asn Met Ala Arg Lys Glu Asn Glu Lys Val Gly Ile  
50 55 60

Phe Asn Cys His Gly Met Gly Gly Asn Gln Val Phe Ser Tyr Thr Ala  
65 70 75 80

Asn Lys Glu Ile Arg Thr Asp Asp Leu Cys Leu Asp Val Ser Lys Leu  
85 90 95

Asn Gly Pro Val Thr Met Leu Lys Cys His His Leu Lys Gly Asn Gln  
100 105 110

Leu Trp Glu Tyr Asp Pro Val Lys Leu Thr Leu Gln His Val Asn Ser  
115 120 125

Asn Gln Cys Leu Asp Lys Ala Thr Glu Glu Asp Ser Gln Val Pro Ser  
130 135 140

Ile Arg Asp Cys Asn Gly Ser Arg Ser Gln Gln Trp Leu Leu Arg Asn  
145 150 155 160

Val Thr Leu Pro Glu Ile Phe  
165

<210> 98  
<211> 417  
<212> DNA  
<213> Homo sapiens

<400> 98

tatccagagt taaggggtcc agaccatcag gatatagctt ttggggcctt gcagcaggga	60
actaactgcc tcgacacttt gggacacttt gctgatggtg tggttggagt ttatgaatgt	120
cacaatgctg ggggaaacca ggaatgggcc ttgacgaagg agaagtcggt gaagcacatg	180
gatttgtgcc ttactgtggt ggaccgggca cccggctctc ttataaagct gcagggctgc	240
cgagaaaatg acagcagaca gaaatgggaa cagatcgagg gcaactccaa gctgaggcac	300
gtgggcagca acctgtgcct ggacagtcgc acggccaaga gcgggggcct aagcgtggag	360
gtgtgtggcc cggccctttc gcagcagtgg aagttcacgc tcaacctgca gcagtag	417

<210> 99  
 <211> 138  
 <212> PRT  
 <213> Homo sapiens  
 <400> 99

Tyr	Pro	Glu	Leu	Arg	Val	Pro	Asp	His	Gln	Asp	Ile	Ala	Phe	Gly	Ala	1	5	10	15
Leu	Gln	Gln	Gly	Thr	Asn	Cys	Leu	Asp	Thr	Leu	Gly	His	Phe	Ala	Asp	20	25	30	
Gly	Val	Val	Gly	Val	Tyr	Glu	Cys	His	Asn	Ala	Gly	Gly	Asn	Gln	Glu	35	40	45	
Trp	Ala	Leu	Thr	Lys	Glu	Lys	Ser	Val	Lys	His	Met	Asp	Leu	Cys	Leu	50	55	60	
Thr	Val	Val	Asp	Arg	Ala	Pro	Gly	Ser	Leu	Ile	Lys	Leu	Gln	Gly	Cys	65	70	75	80
Arg	Glu	Asn	Asp	Ser	Arg	Gln	Lys	Trp	Glu	Gln	Ile	Glu	Gly	Asn	Ser	85	90	95	
Lys	Leu	Arg	His	Val	Gly	Ser	Asn	Leu	Cys	Leu	Asp	Ser	Arg	Thr	Ala	100	105	110	
Lys	Ser	Gly	Gly	Leu	Ser	Val	Glu	Val	Cys	Gly	Pro	Ala	Leu	Ser	Gln	115	120	125	
Gln	Trp	Lys	Phe	Thr	Leu	Asn	Leu	Gln	Gln	130	135								

<210> 100  
 <211> 507  
 <212> DNA  
 <213> Homo sapiens  
 <400> 100

tcatttggtg atctttcaaa aagatttgaa ataaaacacc gtcttcggtg taaaaatttt	60
acatggtatc tgaacaacat ttatccagag gtgtatgtgc cagaccttaa tcctgttata	120
tctggataca ttaaaagcgt tggtcagcct ctatgtctgg atgttggaga aaacaatcaa	180
ggaggcaaac cattaattat gtatacatgt catggacttg ggggaaacca gtactttgaa	240
tactctgctc aacatgaaat tcggcacaac atccagaagg aattatgtct tcatgctgct	300
caaggtctcg ttcagctgaa ggcattgtacc tacaaaggct acaagacagt tgtcactgga	360
gagcagatat gggagatcca gaaggatcaa cttctataca atccattctt aaaaatgtgc	420
ctttcagcaa atggagagca tccaagttta gtgtcatgca acccatcaga tccactccaa	480
aatggatac ttagccaaaa tgattaa	507

<210> 101  
 <211> 167  
 <212> PRT  
 <213> Homo sapiens

<400> 101

Phe	Gly	Asp	Leu	Ser	Lys	Arg	Phe	Glu	Ile	Lys	His	Arg	Leu	Arg	Cys
1				5				10					15		

Lys	Asn	Phe	Thr	Trp	Tyr	Leu	Asn	Asn	Ile	Tyr	Pro	Glu	Val	Tyr	Val
			20				25						30		

Pro	Asp	Leu	Asn	Pro	Val	Ile	Ser	Gly	Tyr	Ile	Lys	Ser	Val	Gly	Gln
		35					40					45			

Pro	Leu	Cys	Leu	Asp	Val	Gly	Glu	Asn	Asn	Gln	Gly	Gly	Lys	Pro	Leu
	50					55					60				

Ile	Met	Tyr	Thr	Cys	His	Gly	Leu	Gly	Gly	Asn	Gln	Tyr	Phe	Glu	Tyr
65					70					75					80

Ser	Ala	Gln	His	Glu	Ile	Arg	His	Asn	Ile	Gln	Lys	Glu	Leu	Cys	Leu
				85					90					95	

His	Ala	Ala	Gln	Gly	Leu	Val	Gln	Leu	Lys	Ala	Cys	Thr	Tyr	Lys	Gly
			100					105					110		

His	Lys	Thr	Val	Val	Thr	Gly	Glu	Gln	Ile	Trp	Glu	Ile	Gln	Lys	Asp
		115					120					125			

Gln	Leu	Leu	Tyr	Asn	Pro	Phe	Leu	Lys	Met	Cys	Leu	Ser	Ala	Asn	Gly
	130					135					140				

Glu	His	Pro	Ser	Leu	Val	Ser	Cys	Asn	Pro	Ser	Asp	Pro	Leu	Gln	Lys
145					150					155					160
										47					

Trp Ile Leu Ser Gln Asn Asp  
165

<210> 102  
<211> 423  
<212> DNA  
<213> Homo sapiens

<400> 102  
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ggtcaaggag gcaatcaatt ctttgaatat acttcaaaca aagaaataag gtttaattct 180  
gtgacagagt tatgtgcaga ggtacctgag caaaaaaatt atgtgggaat gcaaaattgt 240  
cccaaagatg ggttccctgt accagcaaac attatttggc attttaaaga agatggaact 300  
atttttcacc cacactcagg actgtgtctt agtgcttatc ggacaccgga gggccgacct 360  
gatgtacaaa tgagaacttg tgatgctcta gataaaaatc aaatttggag ttttgagaaa 420  
tag 423

<210> 103  
<211> 174  
<212> PRT  
<213> Homo sapiens

<400> 103

Ala Tyr Gly Asp Ile Ser Glu Arg Lys Leu Leu Arg Glu Arg Leu Arg  
1 5 10 15

Cys Lys Ser Phe Asp Trp Tyr Leu Lys Asn Val Phe Pro Asn Leu His  
20 25 30

Val Pro Glu Asp Arg Pro Gly Trp His Gly Ala Ile Arg Ser Arg Gly  
35 40 45

Ile Ser Ser Glu Cys Leu Asp Tyr Asn Ser Pro Asp Asn Asn Pro Thr  
50 55 60

Gly Ala Asn Leu Ser Leu Phe Gly Cys His Gly Gln Gly Gly Asn Gln  
65 70 75 80

Phe Phe Glu Tyr Thr Ser Asn Lys Glu Ile Arg Phe Asn Ser Val Thr  
85 90 95

Glu Leu Cys Ala Glu Val Pro Glu Gln Lys Asn Tyr Val Gly Met Gln  
100 105 110



Asn Cys Pro Lys Asp Gly Phe Pro Val Pro Ala Asn Ile Ile Trp His  
 115 120 125

Phe Lys Glu Asp Gly Thr Ile Phe His Pro His Ser Gly Leu Cys Leu  
 130 135 140

Ser Ala Tyr Arg Thr Pro Glu Gly Arg Pro Asp Val Gln Met Arg Thr  
 145 150 155 160

Cys Asp Ala Leu Asp Lys Asn Gln Ile Trp Ser Phe Glu Lys  
 165 170

<210> 104  
 <211> 510  
 <212> DNA  
 <213> Homo sapiens

<400> 104  
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 ttcaaagtgt acttgagagaa tgtctttcct gacttaaggg ctcccattgt gagagctagt 120  
 ggtgtgctta ttaatgtggc tttgggtaaa tgcatttcca ttgaaaacac tacagtcatt 180  
 ctggaagact gcgatgggag caaagagctt caacaattta attacacctg gttaagactt 240  
 attaaatgtg gagaatggtg tatagcccc atccctgata aaggagccgt aaggctgcac 300  
 ccttgatgata acagaaacaa agggctaataa tggctgcata aatcaacatc agtctttcat 360  
 ccagaactgg tgaatcacat tgtttttgaa aacaatcagc aattattatg cttggaagga 420  
 aatttttctc aaaagatcct gaaagtagct gcctgtgacc cagtgaagcc atatcaaaag 480  
 tggaaatttg aaaaatatta tgaagcctga 510

<210> 105  
 <211> 168  
 <212> PRT  
 <213> Homo sapiens

<400> 105  
 Asp Val Gly Asn Leu Thr Gln Gln Arg Glu Leu Arg Lys Lys Leu Lys  
 1 5 10 15

Cys Lys Ser Phe Lys Trp Tyr Leu Glu Asn Val Phe Pro Asp Leu Arg  
 20 25 30

Ala Pro Ile Val Arg Ala Ser Gly Val Leu Ile Asn Val Ala Leu Gly  
 35 40 45

Lys Cys Ile Ser Ile Glu Asn Thr Thr Val Ile Leu Glu Asp Cys Asp  
 50 55 60

Gly Ser Lys Glu Leu Gln Gln Phe Asn Tyr Thr Trp Leu Arg Leu Ile  
65 70 75 80

Lys Cys Gly Glu Trp Cys Ile Ala Pro Ile Pro Asp Lys Gly Ala Val  
85 90 95

Arg Leu His Pro Cys Asp Asn Arg Asn Lys Gly Leu Lys Trp Leu His  
100 105 110

Lys Ser Thr Ser Val Phe His Pro Glu Leu Val Asn His Ile Val Phe  
115 120 125

Glu Asn Asn Gln Gln Leu Leu Cys Leu Glu Gly Asn Phe Ser Gln Lys  
130 135 140

Ile Leu Lys Val Ala Ala Cys Asp Pro Val Lys Pro Tyr Gln Lys Trp  
145 150 155 160

Lys Phe Glu Lys Tyr Tyr Glu Ala  
165

<210> 106  
<211> 498  
<212> DNA  
<213> Homo sapiens

<400> 106  
tccttcggtg acatttcgga acgactgcag ctgaggggaac aactgcactg tcacaacttt 60  
tccttggtacc tgcacaatgt ctaccagag atgtttgttc ctgacctgac gccaccttc 120  
tatggtgcc tcaagaacct cggcaccaac caatgcctgg atgtgggtga gaacaaccgc 180  
ggggggaagc ccctcatcat gtactcctgc cacggccttg gcggcaacca gtactttgag 240  
tacacaactc agagggacct tcgccacaac atcgcaaagc agctgtgtct acatgtcagc 300  
aagggtgctc tgggccttgg gagctgtcac ttactggca agaatagcca ggtccccaag 360  
gacgaggaat ggggaattggc ccaggatcag ctcatcagga actcaggatc tggtagctgc 420  
ctgacatccc aggacaaaaa gccagccatg gccccctgca atcccagtga ccccatcag 480  
ttgtggctct ttgtctag 498

<210> 107  
<211> 165  
<212> PRT  
<213> Homo sapiens

<400> 107  
Ser Phe Gly Asp Ile Ser Glu Arg Leu Gln Leu Arg Glu Gln Leu His  
1 5 10 15



<210> 109  
 <211> 166  
 <212> PRT  
 <213> Homo sapiens

<400> 109

Tyr Gly Asp Ile Ser Glu Leu Lys Lys Phe Arg Glu Asp His Asn Cys  
 1 5 10 15

Gln Ser Phe Lys Trp Phe Met Glu Glu Ile Ala Tyr Asp Ile Thr Ser  
 20 25 30

His Tyr Pro Leu Pro Pro Lys Asn Val Asp Trp Gly Glu Ile Arg Gly  
 35 40 45

Phe Glu Thr Ala Tyr Cys Ile Asp Ser Met Gly Lys Thr Asn Gly Gly  
 50 55 60

Phe Val Glu Leu Gly Pro Cys His Arg Met Gly Gly Asn Gln Leu Phe  
 65 70 75 80

Arg Ile Asn Glu Ala Asn Gln Leu Met Gln Tyr Asp Gln Cys Leu Thr  
 85 90 95

Lys Gly Ala Asp Gly Ser Lys Val Met Ile Thr His Cys Asn Leu Asn  
 100 105 110

Glu Phe Lys Glu Trp Gln Tyr Phe Lys Asn Leu His Arg Phe Thr His  
 115 120 125

Ile Pro Ser Gly Lys Cys Leu Asp Arg Ser Glu Val Leu His Gln Val  
 130 135 140

Phe Ile Ser Asn Cys Asp Ser Ser Lys Thr Thr Gln Lys Trp Glu Met  
 145 150 155 160

Asn Asn Ile His Ser Val  
 165

<210> 110  
 <211> 534  
 <212> DNA  
 <213> Homo sapiens

<400> 110

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ctgaaaaaatg tttatccact cttgaagcca ctccacacca tcgtgggcta tggaagaatg	120
aaaaacctat tggatgaaaa tgtctgcttg gatcagggac ccgttccagg caacaccccc	180

atcatgtatt actgcatga attcagctca cagaatgtct actatcacct aactggggag 240  
 ctctatgtgg gacaactgat tgcagaggcc agtgctagtg atcgctgcct gacagaccct 300  
 ggcaaggcgg agaagccac cttagaacca tgctccaagg cagctaagaa tagactgcat 360  
 atatattggg attttaaacc gggaggagct gtcataaaca gagatacaa gcggtgtctg 420  
 gagatgaaga aggatctttt gggtagccac gtgcttgtgc tccagacctg tagcacgcaa 480  
 gtgtgggaaa tccagcacac tgtcagagac tggggtcaga ccaacagcca gtga 534

<210> 111  
 <211> 179  
 <212> PRT  
 <213> Homo sapiens

<400> 111

Phe Gly Asp Val Ser Ser Arg Met Ala Leu Arg Glu Lys Leu Lys Cys  
 1 5 10 15

Lys Thr Phe Asp Trp Tyr Leu Lys Asn Val Tyr Pro Leu Leu Lys Pro  
 20 25 30

Leu His Thr Ile Val Gly Tyr Gly Arg Met Lys Asn Leu Leu Asp Glu  
 35 40 45

Asn Val Cys Leu Asp Gln Gly Pro Val Pro Gly Asn Thr Pro Ile Met  
 50 55 60

Tyr Tyr Cys His Glu Phe Ser Ser Gln Asn Val Tyr Tyr His Leu Thr  
 65 70 75 80

Gly Glu Leu Tyr Val Gly Gln Leu Ile Ala Glu Ala Ser Ala Ser Asp  
 85 90 95

Arg Cys Leu Thr Asp Pro Gly Lys Ala Glu Lys Pro Thr Leu Glu Pro  
 100 105 110

Cys Ser Lys Ala Ala Lys Asn Arg Leu His Ile Tyr Trp Asp Phe Lys  
 115 120 125

Pro Gly Gly Ala Val Ile Asn Arg Asp Thr Lys Arg Cys Leu Glu Met  
 130 135 140

Lys Lys Asp Leu Leu Gly Ser His Val Leu Val Leu Gln Thr Cys Ser  
 145 150 155 160

Thr Gln Val Trp Glu Ile Gln His Thr Val Arg Asp Trp Gly Gln Thr  
 165 170 175

Asn Ser Gln

<210> 112  
 <211> 534  
 <212> DNA  
 <213> Homo sapiens

<400> 112  
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 tggtacctgg agaacgtgta cccggagatg aggggtctaca acaacaccct cacgtacgga 120  
 gaggtgagaa acagcaaagc cagtgcctac tgtctggacc agggagcggg ggacggcgac 180  
 cgggcatcc tctaccctg ccacgggatg tcctcccagc tgggtgcggta cagcgctgac 240  
 ggcctgctgc agctggggcc tctgggctcc acagccttct tgcctgactc caagtgtctg 300  
 gtggatgacg gcacggggcc catgcccacc ctgaagaggt gtgaggatgt ggcgcggcca 360  
 acacagcggc tgtgggactt caccagagt ggccccattg tgagccgggc cacgggcccgc 420  
 tgcctggagg tggagatgtc caaagatgcc aactttgggc tccggctggg ggtacagagg 480  
 tgctcggggc agaagtggat gatcagaaac tggatcaaac acgcacggca ctga 534

<210> 113  
 <211> 177  
 <212> PRT  
 <213> Homo sapiens

<400> 113  
 Phe Gly Asp Val Ser Glu Arg Leu Ala Leu Arg Gln Arg Leu Lys Cys  
 1 5 10 15  
 Arg Ser Phe Lys Trp Tyr Leu Glu Asn Val Tyr Pro Glu Met Arg Val  
 20 25 30  
 Tyr Asn Asn Thr Leu Thr Tyr Gly Glu Val Arg Asn Ser Lys Ala Ser  
 35 40 45  
 Ala Tyr Cys Leu Asp Gln Gly Ala Glu Asp Gly Asp Arg Ala Ile Leu  
 50 55 60  
 Tyr Pro Cys His Gly Met Ser Ser Gln Leu Val Arg Tyr Ser Ala Asp  
 65 70 75 80  
 Gly Leu Leu Gln Leu Gly Pro Leu Gly Ser Thr Ala Phe Leu Pro Asp  
 85 90 95  
 Ser Lys Cys Leu Val Asp Asp Gly Thr Gly Arg Met Pro Thr Leu Lys  
 100 105 110

Arg Cys Glu Asp Val Ala Arg Pro Thr Gln Arg Leu Trp Asp Phe Thr  
115 120

Gln Ser Gly Pro Ile Val Ser Arg Ala Thr Gly Arg Cys Leu Glu Val  
130 135 140

Glu Met Ser Lys Asp Ala Asn Phe Gly Leu Arg Leu Val Val Gln Arg  
145 150 155 160

Cys Ser Gly Gln Lys Trp Met Ile Arg Asn Trp Ile Lys His Ala Arg  
165 170 175

His

<210> 114  
<211> 564  
<212> DNA  
<213> Homo sapiens

<400> 114  
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tggtttatga cgaagatagc ctgggacctg cccaaattct acccaccctg ggagcccccg 120  
gctgcagctt ggggggagat ccgaaatgtg ggcacagggc tgtgtgcaga caciaagcac 180  
ggggccttgg gctccccact aaggctagag ggctgctgcc gaggccgtgg ggaggctgcc 240  
tggaacaaca tgcaggtatt caccttcacc tggagagagg acatccggcc tggagacccc 300  
cagcacacca agaagttctg ctttgatgcc atttcccaca ccagccctgt cacgctgtac 360  
gactgccaca gcatgaaggg caaccagctg tggaaatacc gcaaagacaa gaccctgtac 420  
caccctgtca gtggcagctg catggactgc agtgaaagt accataggat cttcatgaac 480  
acctgcaacc catcctctct caccagcag tggctgtttg aacacaccaa ctcaacagtc 540  
ttggaaaaat tcaataggaa ctga 564

<210> 115  
<211> 187  
<212> PRT  
<213> Homo sapiens

<400> 115

Ala Gly Asp Val Ala Val Gln Lys Lys Leu Arg Ser Ser Leu Asn Cys  
1 5 10 15

Lys Ser Phe Lys Trp Phe Met Thr Lys Ile Ala Trp Asp Leu Pro Lys  
20 25 30

Phe Tyr Pro Pro Val Glu Pro Pro Ala Ala Ala Trp Gly Glu Ile Arg  
35 40 45

Asn Val Gly Thr Gly Leu Cys Ala Asp Thr Lys His Gly Ala Leu Gly  
 50 55 60  
 Ser Pro Leu Arg Leu Glu Gly Cys Val Arg Gly Arg Gly Glu Ala Ala  
 65 70 75 80  
 Trp Asn Asn Met Gln Val Phe Thr Phe Thr Trp Arg Glu Asp Ile Arg  
 85 90 95  
 Pro Gly Asp Pro Gln His Thr Lys Lys Phe Cys Phe Asp Ala Ile Ser  
 100 105 110  
 His Thr Ser Pro Val Thr Leu Tyr Asp Cys His Ser Met Lys Gly Asn  
 115 120 125  
 Gln Leu Trp Lys Tyr Arg Lys Asp Lys Thr Leu Tyr His Pro Val Ser  
 130 135 140  
 Gly Ser Cys Met Asp Cys Ser Glu Ser Asp His Arg Ile Phe Met Asn  
 145 150 155 160  
 Thr Cys Asn Pro Ser Ser Leu Thr Gln Gln Trp Leu Phe Glu His Thr  
 165 170 175  
 Asn Ser Thr Val Leu Glu Lys Phe Asn Arg Asn  
 180 185

<210> 116  
 <211> 549  
 <212> DNA  
 <213> Homo sapiens

<400> 116  
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 tattttggata atgtataccc agagatgcag atatctgggt cccacgcaa accccaacaa 120  
 cccattttttg tcaatagagg gccaaaacga ccaaagtcc ttcaacgtgg aaggctctat 180  
 cacctccaga ccaacaaatg cctggtggcc cagggccgcc caagtcagaa gggaggtctc 240  
 gtggtgctta aggcctgtga ctacagtgc ccaaatcaga tctggatcta taatgaagag 300  
 catgaattgg ttttaaatag tctcctttgt ctagatatgt cagagactcg ctcacagac 360  
 ccgccacggc tcatgaaatg ccacgggtca ggaggatccc agcagtggac ctttgggaaa 420  
 aacaatcggc tataccaggt gtcggttgga cagtgcctga gagcagtgga tcccctgggt 480  
 cagaagggct ctgtcgccat ggcgatctgc gatggctcct cttcacagca gtggcatttg 540  
 gaaggttaa 549



<210> 117  
 <211> 181  
 <212> PRT  
 <213> Homo sapiens

<400> 117

Asn Ile Ser Glu Arg Val Glu Leu Arg Lys Lys Leu Gly Cys Lys Ser  
 1 5 10 15

Phe Lys Trp Tyr Leu Asp Asn Val Tyr Pro Glu Met Gln Ile Ser Gly  
 20 25 30

Ser His Ala Lys Pro Gln Gln Pro Ile Phe Val Asn Arg Gly Pro Lys  
 35 40 45

Arg Pro Lys Val Leu Gln Arg Gly Arg Leu Tyr His Leu Gln Thr Asn  
 50 55 60

Lys Cys Leu Val Ala Gln Gly Arg Pro Ser Gln Lys Gly Gly Leu Val  
 65 70 75 80

Val Leu Lys Ala Cys Asp Tyr Ser Asp Pro Asn Gln Ile Trp Ile Tyr  
 85 90 95

Asn Glu Glu His Glu Leu Val Leu Asn Ser Leu Leu Cys Leu Asp Met  
 100 105 110

Ser Glu Thr Arg Ser Ser Asp Pro Pro Arg Leu Met Lys Cys His Gly  
 115 120 125

Ser Gly Gly Ser Gln Gln Trp Thr Phe Gly Lys Asn Asn Arg Leu Tyr  
 130 135 140

Gln Val Ser Val Gly Gln Cys Leu Arg Ala Val Asp Pro Leu Gly Gln  
 145 150 155 160

Lys Gly Ser Val Ala Met Ala Ile Cys Asp Gly Ser Ser Ser Gln Gln  
 165 170 175

Trp His Leu Glu Gly  
 180

<210> 118  
 <211> 525  
 <212> DNA  
 <213> Homo sapiens

<400> 118

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60

ttcttggaga ctgtgtatcc agaactgcat gtgcctgagg acaggcctgg cttcttcggg 120  
 atgtctccaga acaaaggact aacagactac tgctttgact ataaccctcc cgatgaaaac 180  
 cagattgtgg gacaccaggt cattctgtac ctctgtcatg ggatgggcca gaatcagttt 240  
 ttcgagtaca cgtcccagaa agaaatacgc tataacaccc accagcctga gggctgcatt 300  
 gctgtggaag caggaatgga tacccttattc atgcatctct gcgaagaaac tgccccagag 360  
 aatcagaagt tcattcttgca ggaggatgga tctttatttc acgaacagtc caagaaatgt 420  
 gtccaggctg cgaggaagga gtcgagtgc agtttcgttc cactcttacg agactgcacc 480  
 aactcggatc atcagaaatg gttcttcaaa gagcgcattgt tatga 525

<210> 119  
 <211> 173  
 <212> PRT  
 <213> Homo sapiens

<400> 119

Asp Val Thr Glu Arg Lys Gln Leu Arg Asp Lys Leu Gln Cys Lys Asp  
 1 5 10 15

Phe Lys Trp Phe Leu Glu Thr Val Tyr Pro Glu Leu His Val Pro Glu  
 20 25 30

Asp Arg Pro Gly Phe Phe Gly Met Leu Gln Asn Lys Gly Leu Thr Asp  
 35 40 45

Tyr Cys Phe Asp Tyr Asn Pro Pro Asp Glu Asn Gln Ile Val Gly His  
 50 55 60

Gln Val Ile Leu Tyr Leu Cys His Gly Met Gly Gln Asn Gln Phe Phe  
 65 70 75 80

Glu Tyr Thr Ser Gln Lys Glu Ile Arg Tyr Asn Thr His Gln Pro Glu  
 85 90 95

Gly Cys Ile Ala Val Glu Ala Gly Met Asp Thr Leu Ile Met His Leu  
 100 105 110

Cys Glu Glu Thr Ala Pro Glu Asn Gln Lys Phe Ile Leu Gln Glu Asp  
 115 120 125

Gly Ser Leu Phe His Glu Gln Ser Lys Lys Cys Val Gln Ala Ala Arg  
 130 135 140

Lys Glu Ser Ser Asp Ser Phe Val Pro Leu Leu Arg Asp Cys Thr Asn  
 145 150 155 160

Ser Asp His Gln Lys Trp Phe Phe Lys Glu Arg Met Leu  
165 170

<210> 120  
<211> 528  
<212> DNA  
<213> Homo sapiens

<400> 120  
tctgagaagc cagactgcat ggaacgcttg cagctgcaaa ggagactggg ttgtcggaca 60  
ttccactggg ttctggctaa tgtctaccct gagctgtacc catctgaacc caggcccagt 120  
ttctctggaa agctccacaa cactggactt gggctctgtg cagactgcca ggcagaaggg 180  
gacatcctgg gctgtcccat ggtgttggct ccttgacgtg acagccggca gcaacagtac 240  
ctgcagcaca ccagcaggaa ggagattcac tttggcagcc cacagcacct gtgctttgct 300  
gtcaggcagg agcaggtgat tcttcagaac tgcacggagg aaggcctggc catccaccag 360  
cagcactggg acttccagga gaatgggatg attgtccaca ttctttctgg gaaatgcatg 420  
gaagctgtgg tgcaagaaaa caataaagat ttgtacctgc gtccgtgtga tggaaaagcc 480  
cgccagcagt ggcgttttga ccagatcaat gctgtggatg aacgatga 528

<210> 121  
<211> 174  
<212> PRT  
<213> Homo sapiens

<400> 121  
Glu Lys Pro Asp Cys Met Glu Arg Leu Gln Leu Gln Arg Arg Leu Gly  
1 5 10 15  
Cys Arg Thr Phe His Trp Phe Leu Ala Asn Val Tyr Pro Glu Leu Tyr  
20 25 30  
Pro Ser Glu Pro Arg Pro Ser Phe Ser Gly Lys Leu His Asn Thr Gly  
35 40 45  
Leu Gly Leu Cys Ala Asp Cys Gln Ala Glu Gly Asp Ile Leu Gly Cys  
50 55 60  
Pro Met Val Leu Ala Pro Cys Ser Asp Ser Arg Gln Gln Gln Tyr Leu  
65 70 75 80  
Gln His Thr Ser Arg Lys Glu Ile His Phe Gly Ser Pro Gln His Leu  
85 90 95  
Cys Phe Ala Val Arg Gln Glu Gln Val Ile Leu Gln Asn Cys Thr Glu  
100 105 110

Glu Gly Leu Ala Ile His Gln Gln His Trp Asp Phe Gln Glu Asn Gly  
 115 120 125

Met Ile Val His Ile Leu Ser Gly Lys Cys Met Glu Ala Val Val Gln  
 130 135 140

Glu Asn Asn Lys Asp Leu Tyr Leu Arg Pro Cys Asp Gly Lys Ala Arg  
 145 150 155 160

Gln Gln Trp Arg Phe Asp Gln Ile Asn Ala Val Asp Glu Arg  
 165 170

<210> 122  
 <211> 498  
 <212> DNA  
 <213> Homo sapiens

<400> 122  
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 tggtacctag aaaacatcta tccggactcc cagatcccaa gacgttatta ctcaacttggt 120  
 gagataagaa atgttgaaac caatcagtgt ttagacaaca tgggccgcaa ggaaaatgaa 180  
 aaagtgggta tattcaactg tcatgggtatg ggaggaaatc aggtattttc ttacactgct 240  
 gacaaagaaa tccgaaccga tgacttgtgc ttggatgttt ctagactcaa tggacctgta 300  
 atcatgttaa aatgccacca tatgagagga aatcagttat gggaatatga tgctgagaga 360  
 ctcacgttgc gacatgttaa cagtaaccaa tgtctcgatg aaccttctga agaagacaaa 420  
 atggtgccta caatgcagga ctgtagtgga agcagatccc aacagtggct gctaaggaac 480  
 atgaccttgg gcacatga 498

<210> 123  
 <211> 165  
 <212> PRT  
 <213> Homo sapiens

<400> 123  
 Tyr Gly Asp Val Ser Val Arg Lys Thr Leu Arg Glu Asn Leu Lys Cys  
 1 5 10 15  
 Lys Pro Phe Ser Trp Tyr Leu Glu Asn Ile Tyr Pro Asp Ser Gln Ile  
 20 25 30  
 Pro Arg Arg Tyr Tyr Ser Leu Gly Glu Ile Arg Asn Val Glu Thr Asn  
 35 40 45  
 Gln Cys Leu Asp Asn Met Gly Arg Lys Glu Asn Glu Lys Val Gly Ile  
 50 55 60

Phe Asn Cys His Gly Met Gly Gly Asn Gln Val Phe Ser Tyr Thr Ala  
65 70 75 80

Asp Lys Glu Ile Arg Thr Asp Asp Leu Cys Leu Asp Val Ser Arg Leu  
85 90 95

Asn Gly Pro Val Ile Met Leu Lys Cys His His Met Arg Gly Asn Gln  
100 105 110

Leu Trp Glu Tyr Asp Ala Glu Arg Leu Thr Leu Arg His Val Asn Ser  
115 120 125

Asn Gln Cys Leu Asp Glu Pro Ser Glu Glu Asp Lys Met Val Pro Thr  
130 135 140

Met Gln Asp Cys Ser Gly Ser Arg Ser Gln Gln Trp Leu Leu Arg Asn  
145 150 155 160

Met Thr Leu Gly Thr  
165

<210> 124  
<211> 516  
<212> DNA  
<213> Homo sapiens

<400> 124  
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ggtacctgga gaatatctac cctgaactca gcatcccaa ggagtcctcc atccagaagg 120  
gcaatatccg acagagacag aagtgcctgg aatctcaaag gcagaacaac caagaaaccc 180  
caaacctaaa gttgagcccc tgtgccaagg tcaaaggcga agatgcaaag tcccaggtat 240  
gggccttcac atacaccag aagatcctcc aggaggagct gtgcctgtca gtcacacct 300  
tgttcctgg cgccccagt gttcttgtcc tttgcaagaa tggagatgac cgacagcaat 360  
ggaccaaacc tgggtccac atcgagcaca tagcatccca cctctgcctc gatacagata 420  
tgttcggtga tggcaccgag aacggcaagg aaatcggcgt caacccatgt gagtcctcac 480  
tcatgagcca gactgggac atggtgagtt cttgag 516

<210> 125  
<211> 171  
<212> PRT  
<213> Homo sapiens

<400> 125

Phe Gly Asn Val Glu Ser Arg Leu Asp Leu Arg Lys Asn Leu Arg Cys  
1 5 10 15

Gln Ser Phe Lys Trp Tyr Leu Glu Asn Ile Tyr Pro Glu Leu Ser Ile  
                   20                                  25                                  30  
 Pro Lys Glu Ser Ser Ile Gln Lys Gly Asn Ile Arg Gln Arg Gln Lys  
                   35                                  40                                  45  
 Cys Leu Glu Ser Gln Arg Gln Asn Asn Gln Glu Thr Pro Asn Leu Lys  
                   50                                  55                                  60  
 Leu Ser Pro Cys Ala Lys Val Lys Gly Glu Asp Ala Lys Ser Gln Val  
                   65                                  70                                  75                                  80  
 Trp Ala Phe Thr Tyr Thr Gln Lys Ile Leu Gln Glu Glu Leu Cys Leu  
                                   85                                  90                                  95  
 Ser Val Ile Thr Leu Phe Pro Gly Ala Pro Val Val Leu Val Leu Cys  
                                   100                                  105                                  110  
 Lys Asn Gly Asp Asp Arg Gln Gln Trp Thr Lys Thr Gly Ser His Ile  
                   115                                  120                                  125  
 Glu His Ile Ala Ser His Leu Cys Leu Asp Thr Asp Met Phe Gly Asp  
                   130                                  135                                  140  
 Gly Thr Glu Asn Gly Lys Glu Ile Gly Val Asn Pro Cys Glu Ser Ser  
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 Leu Met Ser Gln His Trp Asp Met Val Ser Ser  
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Phe Arg Trp Tyr Leu Glu Asn Val Tyr Pro Glu Leu Thr Val Pro Val  
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Lys Glu Ala Leu Pro Gly Ile Ile Lys Gln Gly Val Asn Cys Leu Glu  
 35 40 45

Ser Gln Gly Gln Asn Thr Ala Gly Asp Phe Leu Leu Gly Met Gly Ile  
 50 55 60

Cys Arg Gly Ser Ala Lys Asn Pro Gln Pro Ala Gln Ala Trp Leu Phe  
 65 70 75 80

Ser Asp His Leu Ile Gln Gln Gln Gly Lys Cys Leu Ala Ala Thr Ser  
 85 90 95

Thr Leu Met Ser Ser Pro Gly Ser Pro Val Ile Leu Gln Met Cys Asn  
 100 105 110

Pro Arg Glu Gly Lys Gln Lys Trp Arg Arg Lys Gly Ser Phe Ile Gln  
 115 120 125

His Ser Val Ser Gly Leu Cys Leu Glu Thr Lys Pro Ala Gln Leu Val  
 130 135 140

Thr Ser Lys Cys Gln Ala Asp Ala Gln Ala Gln Gln Trp Gln Leu Leu  
 145 150 155 160

Pro His Thr